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DOI:
10.1016/j.jbankfin.2014.08.007

Document Version
Peer reviewed version

Citation for published version (Harvard):
Paiardini, P 2014, 'The Impact of Economic News on Bond Prices: Evidence from the MTS Platform', *Journal of Banking & Finance*, vol. 49, pp. 302-322. https://doi.org/10.1016/j.jbankfin.2014.08.007

The Impact of Economic News on Bond Prices: Evidence from the MTS Platform

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Abstract

Although there is an extensive literature on the impact of macroeconomic announcements on asset prices, the bond market has received less attention than the foreign exchange and equity markets, even less if we consider the European market. This paper uses high-frequency intra-day data over a three-year period to investigate the impact of regularly scheduled macroeconomic news and monetary policy announcements on the returns of the Italian government bond market, the largest one in the Euro-zone. With respect to the previous papers, we use a much broader set of announcements, sixty-eight, and a relatively novel dataset (MTS). We find that twenty-five news have a significant impact on bond returns and that almost all announcements are incorporated into prices within twenty minutes from the release.

JEL codes C5; G10; G14

Keywords: Macroeconomic news announcements; Bond returns; MTS

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I would like to thank the Editor Carol Alexander, one anonymous referee, Magnus Andersson, Alfonso Dufour, Michael Fleming, Sergio Ginebri, Lucio Sarno, Emanuela Sciubba, Stephen Wright for their helpful suggestions. Comments by participants at 25^{th} EEA 2010, Glasgow, 42^{nd} MMF 2010, Limassol, 12^{th} ZEW Summer Workshop for Young Economists 2010, Mannheim, 3^{rd} Brunel PhD Economics & Finance Conference 2010, and Birkbeck PhD Jamboree on previous versions of this paper are also gratefully acknowledged. A special thank goes to the Director of the Domestic Funding Division of the Italian Treasury, Davide Iacovoni, for providing the data used in this paper. The usual disclaimer applies.

1 Introduction

Do financial markets respond to macroeconomic news releases? The price discovery process is of central importance for all financial markets. However, the practice through which fundamentals are incorporated into prices is still a complex one. Economic announcements influence financial markets since they represent unanticipated information on the state of the economy, moreover they enable market participants to learn about recent economic developments and help them to adapt their expectations on the future course of the estimated returns on all asset classes. According to the theory on financial asset prices, movements in prices should reflect the arrival of new information about fundamental asset values. Since financial markets are naturally forward-looking, only the arrive of new news should affect prices (Andersson et al., 2009).

The link between economic news and asset prices has been extensively studied in the academic literature. However, depending on the market of interest –stock, bond or foreign exchange– the empirical evidence is more or less mixed and relatively weak in confirming the theory, especially for studies until the early 1990s that rely on daily, weekly or monthly data (see e.g. Dwyer and Hafer (1989)). The most recent literature has moved towards the use of high-frequency intra-day data which has notably improved the estimation of announcement effects. The idea of using a narrow window to measure the market response to news releases is to reduce the influence of other events that might affect the prices in addition to the surprise component, during the trading day; this was the major shortcoming of daily studies.

The link between macroeconomic news and stock market prices is ambiguous. Ambiguity is due to the fact that stock prices depend on expected cash flows, the discount rate, and the risk premium, that work in opposite directions. Holding the risk premium constant, a positive macroeconomic shock increases expected cash flow and discount rate; however, the former effect in turn increases the stock price whereas the latter decreases it,

leaving the net effect uncertain (Andersen et al., 2007).

The theory concerning the effect of news releases on foreign exchange markets generally predicts that good domestic news strengthen the domestic currency. Most empirical studies support this hypothesis, even if it is subject to various conditions, such as announcement timing, asymmetries, and sign effects. Despite the appeal of the theoretical relation between exchange rates and fundamentals, the empirical evidence is mixed. The missing link is between nominal exchange rates and the economic or financial fundamentals that should theoretically drive exchange rates; many empirical studies suggest that for the foreign exchange market, prices and fundamentals are largely disconnected.

Finally, theory predicts an unambiguous link between macroeconomic announcements and bond prices. Since Treasury cash flows are fixed in nominal terms, while stock cash flows depend on economic conditions, unexpected upward revision of the real activity increases the discount rate with an unequivocal negative final effect of decreasing prices (Fleming and Remolana, 1997). The related empirical literature generally confirms these theoretical predictions.

The previous literature concerning the impact of economic news on asset prices relied on the use of dummy variables (see e.g. Ederington and Lee (1993) for interest rate and foreign exchange futures markets, and Fleming and Remolana (1997) for the U.S. bond market); the most recent literature has moved towards the use of the surprise component of the announcements (Balduzzi et al., 2001).

The majority of papers focus on the U.S. bond market. Balduzzi et al. (2001) and Fleming and Remolona (1999) find that the largest movement in the U.S. bond prices occurs in days of macroeconomic announcements. Green (2004) examines the impact of trading on intra-day five-year government bond prices surrounding the release of U.S. macroeconomic news announcements. He shows that the release of economic news increases the level of information asymmetry in the government bond market, suggesting that some market participants are better able to precisely determine the impact of the

news. Goldberg and Leonard (2003) examine the impact on German government bond yields of various German, Euro area and U.S. macroeconomic data releases, Andersson et al. (2009)consider also the impact of French and Italian national releases finding, however, a very small impact. These are among the few papers that consider the European bond market.

A most recent literature has focused on the impact of monetary policy announcements on the stock market (Bernanke and Kuttner, 2005; Chuliá et al., 2010), the exchange rate (Faust et al., 2003), the money market (Ehrmann and Fratzscher, 2003) and the bond market (Fleming and Remolana, 1997; Andersson et al., 2009; Andersson, 2010; Rigobon and Sack, 2008).

Finally, other papers (Evans, 2011; Jiang et al., 2011; Dungey et al., 2009; Lahaye et al., 2011) study the presence of jumps and co-jumps surrounding macroeconomic releases on the U.S. Treasury bond market.

Several macroeconomic announcements have been found to impact bond prices. Moreover, economic news is incorporated into prices within a very short period of time after its release, usually between five and fifteen minutes, however, the results vary among studies. Balduzzi et al. (2001) find that most announcements tend to be incorporated very quickly into prices (one minute or less), while Fleming and Remolona (1999) pinpoint a substantial increase in trading volume up to half an hour after macroeconomic announcements and Goldberg and Leonard (2003) find a direct and large effect on German government bond yields of U.S. news within one hour of release. Other studies find a very short-lived increase in volatility after the announcement, suggesting that the increased uncertainty after the release decreases rapidly to a normal level (Fleming and Remolona, 1999).; while Andersen and Bollerslev (1998) find that, after certain announcements, the increase in volatility may last up to one trading day.

Our contribution to the existing literature is twofold. Firstly, we contribute to the rather scant literature on the European bond market, examining the effects of the arrival

of public information on prices for the Italian government bond market; the largest one in the Euro-zone and the third largest in the world after the U.S. and Japan. We focus on public information contained in regularly scheduled macroeconomic announcements and ECB's monetary policy statements, usually released at a precise time during the day.

In principle, given that the news release time is known in advance, each announcement can be anticipated and no investor is able to gain advantage from having seen the figures first. However, since macroeconomic announcements differ in terms of relevance, reliability and point of release, their effect on prices may differ. In particular, in our sample, we include German news for which only the day of the release is known in advance, but not the time. The time varies for French news and even when the day and the time of the scheduled announcements are exactly known in advance, as for the Italian news, the actual release time is often different. As it will be further clarified later on in the paper, these aspects together with the timeliness and/or the type of information in a report, contribute to explain differences among news in terms of their relevance and impact for the Italian bond market.

We use a relatively novel database - MTS- which is one of the most important platform for trading government bonds in Europe. It has been used to investigate different topics, such as, for example, the price discovery process (Cheung et al., 2005; Dunne et al., 2007; Caporale and Girardi, 2011; Dufour and Nguyen, 2012), or the liquidity (Beber et al., 2009; Darbha and Dufour, 2013). However, it has never been used to investigate the impact of news on prices, except, to a small extent, by Cheung et al. (2005).

Secondly, we consider a much broader set of regularly scheduled macroeconomic news announcements for the U.S., Euro area as well as for Italy, France and Germany. Following Andersson et al. (2009) we include also news for Germany and France to consider the possible effect of the largest European economies on the Italian bond market and to take into account the fact that, often, Euro area news are released after the national statistics, thus containing pieces of information which are already well-known to

the investors. We consider also the ECB's monetary policy announcements given the importance of monetary policy announcements for bond markets.

We find that twenty-five of the sixty-eight announcements considered have a significant impact, these are: Consumer Price Index only for the Italian news; for the German news: IFO Business Climate, Industrial Production and ZEW Economic Sentiment Survey; for the French news: GDP, Business Confidence, Consumer Price Index and Consumer Spending; for the Euro area: Consumer Price Index and Current Account; for the U.S. news: GDP preliminary, Capacity Utilization, Chicago Purchasing Manager, Consumer Confidence, Consumer Price Index, Factory Orders, Industrial Production, ISM Index, ISM Service, Michigan Sentiment Final, Nonfarm Payrolls, New Home Sales, Trade Balance and Initial Jobless Claims.

The paper proceeds as follows. Section 2 describes the data and analyses the unbiasedness and efficiency of the announcements release. Section 3 empirically investigates the effect of macroeconomic news on prices, using the surprise approach. Section 4 illustrates how quickly bond prices react to economic news announcements. Section 5 concludes.

2 The Data

For the empirical analysis we use two datasets, the MTS bond prices data that records the price, the time and the direction of each transaction and the forecasts survey data on macroeconomic news and monetary policy announcements.

2.1 Bond Prices

The sample data contains trades and quotes for 10 year on-the-run Italian BTPs (*Buoni Pluriennali del Tesoro*) between January 2004 and November 2006[1]. Following the ex-

[1]The bonds in our sample are: IT0003472336, IT0003618383, IT0003719918, IT0003844534 and IT0004019581

isting literature (Coluzzi et al., 2008; Girardi and Impenna, 2013) we define an on-the-run security as the most recently auctioned bond of a particular maturity. It acquires the "benchmark" status when it becomes the most traded bond at that maturity for an adequate period of time[2]. However, for our analysis, this distinction does not affect the results. In fact, there is no difference in terms of liquidity between on-the-run and off-the-run securities. This is due to the obligations imposed on market makers on the MTS platform. As explained in more details later on, market makers who access the MTS platform subscribe a "liquidity pact" that forces them to permanently quote a basket of securities for a minimum number of hours a day and within a maximum spread. These obligations are independent on the on-the-run or off-the-run status of the securities. As a consequence, the number of market makers (hence the number of quotes) is, on average, the same on the on-the-run and on the off-the-run segment and it is higher than it would have been in the absence of these obligations and monitoring (Coluzzi et al., 2008).

The Italian secondary government bond market has the largest outstanding amount in the Eurozone. It had an average of €1,218.071 billion in outstanding Treasury securities between 2004 and 2006, followed by Germany and France[3]. Moreover, among the Italian debt instruments, the BTPs represent the most important one, accounting for 59.93 per cent of the government debt, for the same reference period[4].

We focus on a relative calm period, since during market turbulence normal financial relationships may not be stable. The time range goes from 8:30 A.M. to 5:30 P.M.. Records include a very accurate time stamp of bid and ask quotes, trading volume, trade prices and trade direction (buy or sell)[5].

MTS was first introduced in Italy in 1988. It is a wholesale screen-based regulated electronic market for government bonds and other types of fixed income securities, super-

[2]This period may vary, Girardi and Impenna (2013), for example, consider as benchmark a security that has been traded more than other bonds of the same maturity for at least seven continuous working days.

[3]According to MTS brochures.

[4]According to the Treasury website. www.dt.tesoro.it/en.

[5]Some market rules have now changed, the description provided is related to the rules in use during the sample period covered in the empirical analysis.

vised by the Italian Treasury, the Bank of Italy and CONSOB[6].

BeringPoint (2005) estimates that around 75 percent of all inter-dealer trades, of any maturity, takes place on the MTS platform, while Persaud (2006) reports a figure of 72 percent. With more than 1,000 average number of trades executed daily, MTS is the electronic trading platform most used in Europe (Celent, 2012).

There are two types of market participants, dealers and primary dealers. Primary dealers act as market makers, continuously quoting two-way proposals (bid and ask prices) that are valid for all participants and for the whole day, unless they are modified, cancelled, automatically matched or hit by incoming orders. Dealers are market takers who do not have any market making obligation, they simply accept or not market makers' quotes. Since primary dealers, unlike dealers, may also formulate proposals on any other tradable product, and issue orders for proposals made by other market participants, they can act both as price makers and as price takers.

Within the group of primary dealers, for purposes of public debt management, the Italian Ministry of the Economy and Finance selects a list of so-called Specialists who have to satisfy more stringent requirements in terms of participation to the primary and secondary markets. In return they receive some privileges, such as the exclusive right to participate to supplementary and buy-back auctions.

MTS actually works as a limit order book, where primary dealers make prices posting limit orders and dealers can only use market orders, accepting limit orders and prices. Each bond is assigned to many primary dealers. Proposals are firm, immediately executable and aggregated in an order book, that displays bid and offer prices, and the relative quantity. With the introduction of the "liquidity pact" in 1999, market makers are required to post buy and sell limit orders above a minimum size (proposals must be formulated for a minimum lot of €2.5 or €5 million according to the instrument traded),

[6]Commissione Nazionale per la Società e la Borsa. It is the supervisory authority for the Italian financial products market; its aims are the protection of investors and the efficiency, transparency and development of the market.

within a pre-specified maximum spread depending on their liquidity and maturity (it is higher for assets with a longer maturity) and for a minimum number of hours each day (at least five hours per day). Trades are executed in chronological order and orders are automatically completed at the *best* quoted price. The trading platform provides a lot of real-time screen-based information to all market participants, who can easily know the state of the market and observe the order flow[7].

Trading hours on MTS are characterised by different phases. There are a *pre-market* phase (7:30am-8:00am CET Time), during which market makers can only see their own proposals and input, modify, suspend and reactivate their proposals, and a *pre-open* phase (8:00am-8:15am CET Time) during which the auto-matching of proposals is not active. Official trading hours go from 8:15am to 5:30pm CET time (Dufour and Nguyen, 2012)[8]. Primary dealers insert a proposal on the *best page*, which shows the best bid-ask spread together with its aggregate quantity for all products. All market participants hit the bid or ask price depending on whether they want to sell or buy. Subsequently the contract is finalised ("click and trade" system) and ultimately settlement instructions are automatically generated. We refer to Dufour and Skinner (2004) for a more exhaustive description of the market organization.

We apply different filters to our raw data. Firstly, we check for possible quotes posted outside the MTS trading interval. Secondly, we eliminate all observations for which we have a price or a quantity equal to zero, or a negative best spread. These negative spreads are mainly due to recording errors in the data transfer procedure from MTS to the Treasury[9]. This generates cases of negative bid-ask spreads, which are inconsistent. Third, we eliminate all observations on the 1^{st}, 2^{nd} and 3^{rd} August 2004[10]. Finally, we eliminate all

[7]For a detailed description of the "live" market pages see Cheung et al. (2005).

[8]The market activity during the first fifteen minutes is negligible. Moreover, the first five-minute interval of interest for the news that we consider is 8:30am. Thus, accordingly to the existing literature (Coluzzi et al., 2008; Girardi and Impenna, 2013), for the empirical investigation, we consider trading hours from 8:30am to 5:30pm.

[9]During the period 2004-2005 the number of records transferred to the Treasury is occasionally and marginally different with respect to the number of records in MTS data base (Coluzzi et al., 2008).

[10]The Financial Services Authority (FSA) found that City Group Global Markets Limited (CGML) ex-

quotes that generate a very large bid-ask spread. This is, *de facto*, a way for market makers to suspend active quoting; since no trader would be willing to trade at those prices that will introduce only biases in the data. Following Dufour and Nguyen (2012) we discard all observations with relative quoted spread higher than 50 basis points[11].

Although ''tick-by-tick" data are available we group bond prices into equally spaced time intervals. The length of the interval varies among studies, ranging from 5-minute to up to one hour (Cheung et al., 2005; Jiang et al., 2011; Andersson et al., 2009). We choose 5-minute intervals as a reasonable choice to find a balance between market microstructure noise, arising with ultra-high frequency data, and the loss of potential announcements impact on prices due to a too long sample.

Following Cheung et al. (2005), we define the return (R_t) as 10,000 times the natural logarithm prices difference at two consecutive five-minute intervals ($10,000 * ln(p_t/p_{t-1})$). The prices are the midpoints between bid and ask quotes[12]. The choice of using bid-ask midpoints, instead of transaction prices, is consistent with recent works (Jiang et al., 2011) and avoids the autocorrelation bias of which transaction data suffer; since quotes can be updated even in the absence of trading. Moreover, this choice allows us to avoid problems with the "bid-ask bounce", besides providing more observations. Although the market officially opens at 8:15 A.M., the first quotation is almost always at 8:30 A.M. or later, thus we eliminate the initial return for each trading day (8:30 A.M.-8:35 A.M.). We end up with a sample of 700 trading days and 74,900 five-minute intervals.

Table A.1 contains descriptive statistics for returns, at 5-minute, 8-minute, 10-minute, 15-minute, 20-minute and 30-minute intervals. It shows the mean, the variance, the min-

ecuted a trading strategy on the European government bond markets on 2^{nd} August 2004 which involved the firm building up and then rapidly exiting from very substantial long positions in European government bonds over a period of an hour. The trade caused a temporary disruption to the volumes of bonds quoted and traded on the MTS platform, a sharp drop in bond prices and a temporary withdrawal by some participants from quoting on that platform. The FSA fined CGML on 28^{th} June 2005, £13.9 million (20.9mn Euros) for Eurobond trades. Source: www.fsa.gov.uk

[11]MTS applies a more stringent filter for the end of the day prices (3 basis point), however, this threshold would eliminate too many observations. Our final sample covers a total of 700 days and 75,600 five-minute intervals.

[12]The midpoint is defined as: (Best Bid Price + Best Ask Price)/2.

imum (Min), the maximum, (Max), the Skewness and Kurtosis, while Q_5 and Q_{95} are the 5^{th} and 95^{th} percentile, respectively. Returns tend to be more volatile for longest time intervals and are not normally distributed.

Figure 1 shows the average 5-minute intra-day absolute returns for the whole sample period. Absolute returns reveal a regular pattern, since they are higher at the opening and closing time. Moreover, there are two large spikes at 2:30 P.M. and at 4:00 P.M. in correspondence with the release times of important news (Chicago Purchasing Managers, Factory Orders, ISM Index, ISM Service, New Home Sales, Trade Balance, Initial Jobless Claims). Hence, there is clear evidence for the existence of strong announcement effects. The pattern in the absolute returns is in line with previous researches on bond markets (Ederington and Lee, 1993; Fleming and Remolona, 1999; Andersson et al., 2009).

Figure 2 shows the weekly pattern of average 5-minute absolute returns and news announcements. The absolute returns increase over the week, this might be ascribed to the increasing number of news released on Thursday and Friday.

Figure 1: Average Intra-day Absolute Returns
The graph shows the average absolute returns (Absolute Returns) per 5-min interval (Time) over the whole sample period.

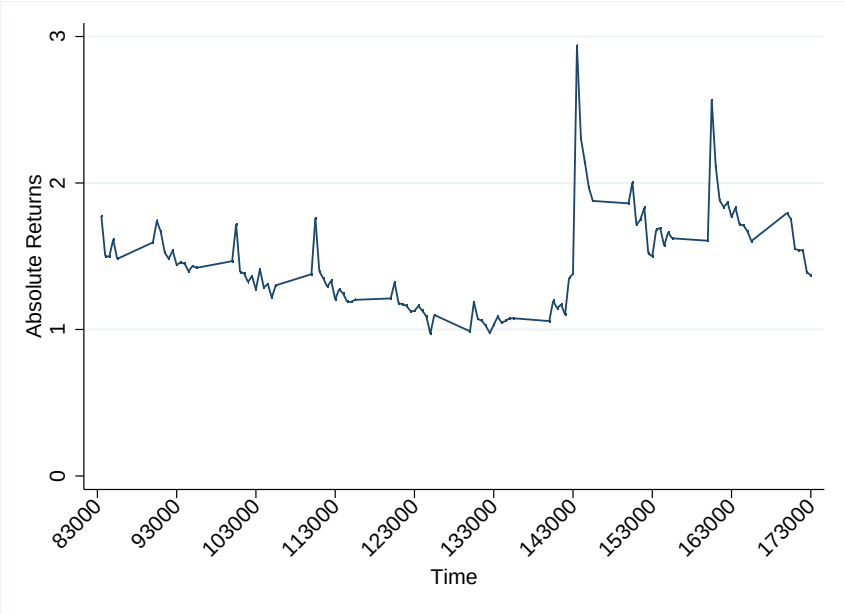
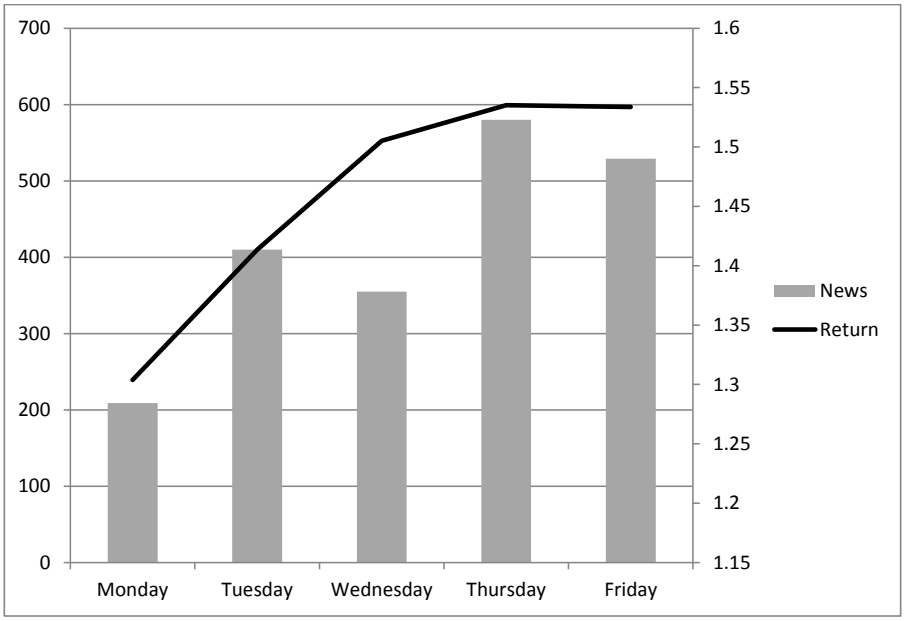


Figure 2: Weekly Pattern of Announcement Releases and Absolute Returns
The graph shows the number of news for each day of the week (News) and the weekly pattern of the average 5-min absolute returns (Return) over the whole sample period.



2.2 Announcements Release

The news dataset includes monetary policy decisions and regularly scheduled macroeconomic announcements for the U.S., Euro area as well as for Italy, France and Germany for the same period of the dataset. We add other news that have not been examined in the previous studies but could be important for bond prices. In line with Andersson et al. (2009), we decide to include also news for Germany and France to consider the possible effect of the largest European economies on the Italian bond market. Moreover, many Euro area news are released after the national statistics, thus containing pieces of information which are already well-known to the investors.

We consider sixty-eight announcements, nine for Italy, five for Germany, nine for France, fifteen for the Euro area and thirty announcements for the U.S.. Table A.3 provides a brief description of salient aspects of macroeconomic and monetary policy announcements. Table A.3 shows, for each news considered, the total number of observations, the scheduled announcement time, the unit in which the announcement is reported, the reporting agency, starting and ending dates of announcement samples and the distribution of the announcements by day of the week. All news are released at regularly scheduled times. For German announcements, only the day is known in advance while the release time is variable. For French events the release time varies between five and ten minutes. For the Italian announcements the day and the time of the news is usually known in advance, however, if during the same day more announcements are released, the first one is released at 10:00 A.M. and the others at 10:30 A.M. and 11:00 A.M. respectively[13].

Moreover, since we are considering also U.S. news release, we convert the EDT (Eastern Daylight Time) time to CET (Central European Time) time, so the announcements released at 8:30 A.M. EDT time are considered at 2:30 P.M. CET, those released at 10:00 A.M. EDT are converted to 4:00 P.M. CET. The scheduled macroeconomic news are published on Bloomberg World Economic Calendar. The expectations about announcements

[13]This is the ISTAT procedure.

is the median response of the survey forecasts that Blooomberg collects from the market agents.

Unfortunately, we cannot take into consideration some news although they might be relevant for the Italian government bond market. Sometimes the news is never released at the same time, or it is released outside the opening trading times. The former is the case for the Italian Government Spending, for example, the latter is often the case with German news (such as GDP, Current Account, Retail Sales, Consumer Confidence, Trade Balance). Other times the lack of survey forecasts prevents us to consider some news. For example, this is the case for the Italian Current Account since the survey forecasts are never available. Moreover, even when the survey forecasts are available, there are often multiple missing observations. Details of missing forecasts for each announcement considered in the empirical analysis are provided in the footnotes to Table A.3 in the Appendix. The announcements with missing forecasts cannot be included in the analysis since it is not possible to compute the surprise.

Figure 3 shows the sequence of announcement releases for a reference Month X, with the usual release time, and illustrates how there is some overlapping across indicators.

As in Balduzzi et al. (2001), we use a standardized surprise measure to compare the different announcements, because units of measure differ across economic variables:

$$S_{i,t} = \frac{A_{i,t} - E_{i,t}}{\sigma_i} \tag{1}$$

where $A_{i,t}$ is the actual data release for announcement i at time t, $E_{i,t}$ is the expected outcome for announcement i at time t and σ_i is the standard deviation of the forecast error of data release i.

Table 1 reports summary statistics for macroeconomic announcements, surveys and surprise.

Figure 3: Distribution of Announcement Releases

Announcements	Month X	Month X + 1	Month X + 2
Italian Announcements			
GDP (quarterly)			VARIES
Business Confidence	9:30		
Consumer Confidence	9:30		
CPI		11:00	
Industrial Orders			10:00
Industrial Production			10:00
PPI		10:00	
Retail Sales			10:00
Trade Balance			10:00
Treasury Auctions	11:00		
German Annucements			
CPI	VARIES		
Factory Orders			12:00
IFO Business Climate	10:00		
Industrial Production			12:00
Unemployment Change		VARIES	
ZEW Economic Sentiment Survey	11:00		
French Announcements			
GDP Advanced (quarterly)		8:40-8:50	
GDP Preliminary (quarterly)			8:40-8:50
Business Confidence	8:40-8:50		
Consumer Confidence	8:40-8:50		
CPI		8:40-8:50	
Consumer Spending	8:40-8:50		
Industrial Production			8:40-8:50
Production Outlook	8:40-8:50		
Unemployment		8:45	
EU Announcements			
GDP (quarterly)			11:00
Business Climate Indicator	11:00		
Composite Index			12:00
Consumer Confidence	11:00		
CPI		11:00	
Current Account			10:00
ECB Meetings	1:45		
Flash HICP	11:00		
HICP		11:00	
Industrial New Orders			11:00
Industrial Production			11:00
M3			10:00
PPI			11:00
Retail Sales			11:00
Trade Balance			11:00
U.S. Announcements			
Current Account (quarterly)			2:30
Employment Cost Index (quarterly)		2:30	
GDP Advance (quarterly)		2:30	
GDP Prelimnary (quarterly)			2:30
Business Inventories			VARIES
Capacity Utilization		3:15	
Chicago Purchasing Manager	4:00		
Composite Index		4:00	
Construction Spending			4:00
Consumer Confidence	4:00		
CPI		2:30	
Durable Goods Orders		2:30	
Existing Home Sales		4:00	
Factory Orders			4:00
Housing Starts		2:30	
Industrial Production		3:15	
ISM Index		4:00	
ISM Non-Manufacturing Business Confidence		4:00	
Michigan Sentiment, prelimanry	3:45		
Michigan Sentiment, final	3:45		
Nonfarm Payrolls		2:30	
New Home Sales		4:00	
NY Empire State Index	2:30		
Personal Income			2:30
PPI			2:30
Personal Spending		2:30	
Retail Sales		2:30	
Trade Balance			2:30
Wholesales Inventories			4:00
Intial Jobless Claims (weekly)	2:30		

Table 1: Summary statistics

	Survey		Actual		Surprise	
Announcements	Mean	Std.Dev.	Mean	Std. Dev.	Mean	Std. Dev.[1]
Italian Announcements						
GDP	0.003	0.001	0.002	0.004	-0.001	0.003
Business Confidence	91.918	3.972	92.209	4.166	0.291	1.988
Consumer Confidence	104.135	3.348	104.429	3.436	0.294	1.985
Consumer Price Index	0.213	0.071	0.159	0.127	-0.053	0.098
Industrial Orders	-0.001	0.009	0.008	0.026	0.009	0.024
Industrial Production	0.002	0.004	-0.001	0.007	-0.003	0.007
Producer Price Index	0.003	0.002	0.004	0.004	0.001	0.003
Retail Sales	0.134	0.201	0.037	0.372	-0.097	0.365
Trade Balance	-854.971	1337.127	-777.452	1474.52	77.519	438.492
German Announcements						
Factory Orders	0.001	0.012	0.006	0.026	0.005	0.023
IFO Business Climate	98.070	4.181	98.542	4.560	0.473	1.174
Industrial Production	0.003	0.006	0.001	0.014	-0.002	0.012
Unemployment Change	2.391	37.295	0.688	70.507	-1.703	45.528
ZEW Economic Sentiment Survey	36.688	24.052	33.841	26.161	-2.847	9.109
French Announcements						
GDP advance	0.005	0.002	0.005	0.004	0	0.003
GDP preliminary	0.006	0.003	0.005	0.003	0	0.001
Business Confidence	104.034	2.625	104.103	2.895	0.069	1.486
Consumer Confidence	-24.867	3.471	-24.967	3.792	-0.1	2.412
Consumer Price Index	0.002	0.002	0.002	0.003	0	0.001
Consumer Spending	-0.000	0.006	0.005	0.015	0.005	0.013
Industrial Production	0.004	0.005	0	0.012	-0.004	0.009
Production Outlook	-0.828	10.41	-0.345	11.58	0.483	7.772
Unemployment	0.098	0.003	0.098	0.003	0	0.001
Euro Area Announcements						
GDP	0.005	0.002	0.005	0.002	0	0
Business climate Indicator	0.005	0.005	0.005	0.005	0	0.002
Consumer Confidence	-12.452	2.541	-12.323	2.482	0.129	0.885
Consumer Price Index	0.002	0.003	0.002	0.003	0	0.001
Current Account	0.547	4.247	-1.113	4.847	-1.66	4.083
ECB Meetings	0.022	0.004	0.022	0.004	0	0
Flash HICP	0.022	0.002	0.022	0.003	0	0.001
HICP	0.022	0.003	0.022	0.003	0	0.001
Industrial New Orders	0.002	0.015	0.003	0.032	0.001	0.026
Industrial Production	0.002	0.006	0.001	0.006	-0.001	0.005
M3	0.07	0.012	0.071	0.012	0.001	0.004
Producer Price Index	0.003	0.003	0.003	0.004	0	0.001
Retail Sales	0.002	0.005	0.001	0.008	-0.001	0.006
Trade Balance	2370.03	3577.583	2394.18	3613.145	24.15	1363.776
U.S. Announcements						
Current Account	-184.627	30.079	-184.527	30.476	0.1	7.552
Employment Cost Index	0.008	0.002	0.008	0.001	0	0.002
GDP advance	0.037	0.009	0.032	0.011	-0.005	0.005
GDP preliminary	0.036	0.011	0.036	0.01	0	0.002
Business Inventories	0.004	0.002	0.005	0.003	0	0.002
Capacity Utilization	0.794	0.019	0.794	0.02	-0.001	0.003
Chicago Purchasing Managers	59.2	2.872	60.788	4.61	1.588	4.855

Continued on next page...

Table 1 (cont)

	Survey		Actual		Surprise	
Announcements	Mean	Std.Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Composite Index	0.001	0.003	0	0.004	0	0.002
Construction Spending	0.004	0.003	0.002	0.006	-0.001	0.006
Consumer Confidence	99.147	5.872	99.662	6.826	0.516	4.114
Consumer Price Index	0.002	0.003	0.003	0.004	0	0.001
Durable Goods Orders	0.006	0.011	0.004	0.035	-0.002	0.028
Existing Home Sales	6.676	0.33	6.74	0.333	0.064	0.175
Factory Orders	0.005	0.019	0.005	0.018	0.001	0.007
Housing Starts	1962.188	94.257	1966.844	135.49	4.656	119.352
Industrial Production	0.004	0.003	0.003	0.005	-0.001	0.003
ISM Index	71.427	9.336	71.683	10.821	0.257	5.101
ISM Services	59.803	2.523	60.367	3.633	0.564	3.006
Michigan Sentiment, preliminary	90.765	6.083	89.556	6.279	-1.209	3.825
Michigan Sentiment, final	90.224	6.575	90.364	6.543	0.139	1.861
Nonfarm Payrolls	170.424	68.868	151.212	87.409	-19.212	85.64
New Home Sales	1189.656	83.78	1212.063	108.558	22.406	98.413
NY Empire State Index	20.15	8.114	21.235	10.314	1.085	9.738
Personal Income	0.004	0.008	0.005	0.008	0	0.003
Producer Price Index	0.003	0.004	0.002	0.008	0	0.005
Personal Spending	0.004	0.003	0.004	0.004	0	0.001
Retail Sales	0.003	0.007	0.004	0.01	0	0.005
Trade Balance	-57.197	8.484	-57.888	8.140	-0.691	3.24
Wholesales Inventories	0.005	0.001	0.007	0.004	0.001	0.004
Initial Jobless Claims	326.371	20.075	326.049	23.553	-0.322	16.181

[1] Standard deviation of the surprise before standardization.
This table shows, for each announcement considered, the mean and the standard deviation of the survey expectations, the actual value and the surprise, calculated as in Equation1.

2.3 Unbiasedness and Efficiency of Survey Data

We study the effect of news on bond returns using an event-study approach. The results of these types of studies may be largely influenced by the accuracy measures of the survey forecasts. In fact, the surprise component could contain measurement errors from a variety of sources. Rigobon and Sack (2008) underline two concerns related to the inappropriateness of the expectations measured from these surveys for gauging the market response. Their first concern is related to the cross-section of panelists. The survey respondents could not be necessarily the market participants whose expectations matter, furthermore, they come from a variety of backgrounds and have different skills so that certain individual responses could distort the measures. The second concern is related to the timing of the surveys. Ideally, the market expectations should be known immediately before the data release, however, the surveys responses are often collected a week before

the news release, raising awareness about their staleness[14].

In spite of these potential weakness, many studies (Pearce and Roley, 1985; McQueen and Roley, 1993) use the survey forecasts to calculate the surprise component in economic announcements showing that, in most cases, they are neither biased nor stale. Among the most recent literature, Balduzzi et al. (2001) and Andersen et al. (2003) use the median responses from the Money Market Services (MMS) survey, to show that the MMS expectations contain valuable information about the forecasted variables are unbiased. Moreover, although these forecasts could not be always efficient, especially if short test periods are used, Balduzzi et al. (2001) find that they outperform commonly used time series models, since they have significantly lower mean squared errors comparing to autoregressive models. Andersson et al. (2009) find similar results testing the quality of the Bloomberg forecasts.

Following Ehrmann et al. (2002) and Andersson et al. (2009), we test for unbiasedness and efficiency of the survey data which are both requirements for rationality that must be satisfied if the survey forecasts actually represent the consensus opinion of the market as a whole. There is the possibility that the survey forecasts do not capture all information available immediately before the announcement. In fact, the information does not stop flowing between the time the survey forecast is collected and the time the macroeconomic indicator is released. This could affect especially the Bloomberg forecasts that are produced sometimes two weeks in advance of the announcements releases.

In order to test for unbiasedness we implement the following regression:

$$A_{i,t} = \alpha + \beta E_{i,t} + \varepsilon_t \tag{2}$$

where $A_{i,t}$ and $E_{i,t}$ are defined as in Equation 1.

If the survey data is informative and the market expectations are unbiased we should

[14] Bloomberg expectations are submitted at irregular times, between one week and two weeks in advance of the news release.

find that the estimates for α should not be significantly different from zero and the estimates for β should not be significantly different from 1. We use a Wald test to investigate the joint hypothesis that $\alpha = 0$ and $\beta = 1$. Results are reported in Table A.2 in the Appendix.

The null hypothesis cannot be rejected for most of the announcements at 5 percent level and 10 percent level, however, for some data releases this hypothesis is rejected. In particular, the following survey expectations are found to be biased predictors for actual data: the Italian PPI; the German IFO business climate; the French industrial production, the Euro area PPI, the U.S. employment cost index, GDP advance, Chicago purchasing mangers index, composite index, CPI, durable goods orders, industrial production, Michigan sentiment preliminary, nonfarm payroll and PPI. These results are in line with the literature (Andersson et al., 2009; Balduzzi et al., 2001), although there is not a perfect correspondence between the biased results.

For two European announcements (GDP Preliminary and ECB Meetings) the results indicate perfect match between the survey forecasts and the actual announcements. For the ECB Meetings this means that market participants have been able to anticipate the decision taken by the ECB, as the surprise component (measured by the difference between the actual and the expected outcome) is always zero. This result is in line with Andersson et al. (2009) who find the same outcome for the German bond market response between 1999 and 2005. The perfect match for the GDP Preliminary is an example of how the timing matters, so that news released earlier tends to have greater impact than those released later (Andersen et al., 2003). The GDP Advance is released one month after the quarter the figure refers to is over (i.e. the Q1 advance GDP figure is usually announced in the middle of May), the preliminary figure is released one month afterwards (i.e. in June). Thus, the information content of these announcements is potentially increasing. Moreover, since these are the European equivalents for the national GDP figures, they are potentially less informative since they are released after the national counterparties.

Overall, we can conclude that our survey data is unbiased and forecasts do capture all information available immediately before the announcement. Evidence of some leakage for few announcements has the consequence that our estimated news response coefficients, which correspond only to the impact at the time of the official announcement, are lower bounds for the total news impact.

To test for efficiency of data we inspect whether forecasts of macroeconomic announcements can be predicted regularly on the basis of past announcements:

$$S_{i,t} = \zeta + \sum_{p=1}^{P} \psi_p A_{i,t-p} + \varepsilon_t \tag{3}$$

where $S_{i,t}$ is defined as the difference between the actual and the expected value for each announcement i at time, t $(A_{i,t} - E_{i,t})$. According to Gravelle and Moessner (2001) we choose a lag length of P=12 for monthly data and P=4 for quarterly data. However, announcements are not always released at the same time (especially those concerning single European countries), thus we use Akaike and Schwartz information criteria to choose the optimal number of lags. We perform a Wald test of the null hypothesis that $\psi_1 = \psi_2 = ... = \psi_P = 0$. Results are reported in Table A.4 in the Appendix.

Also in this case the Wald test shows that this hypothesis cannot be rejected at 5 percent level for almost all the announcements, except for the Italian GDP, the German economic sentiment survey, the U.S construction spending, factory orders and retail sales. Overall, we can conclude that our survey data are only marginally inefficient, thus we can rely on them for the analysis.

3 Which announcements move the bond market?

If the market's movements are a reaction to new information, it is reasonable to assume that some announcements induce a stronger reaction than others, on the basis of their informativeness about the economy.

In constructing our news sample we eliminate all the news released on non-trading days and outside the trading time interval of our market.

How financial markets react to the release of monetary policy decisions is of fundamental importance for policymakers, since they can measure whether market participants respond in accordance to their intentions. Andersson (2010) finds a strong increase in intra-day volatility when monetary policy decisions are released by the Federal Reserve and the European Central Bank, although the reaction on U.S. financial markets following the Fed's decisions is more pronounced than the European markets reaction to the ECB's decisions. Moreover, he finds that the level of intra-day volatility on the European markets is higher when there are changes in the interest rates, with respect to the periods when the ECB did not alter them. However, since both the six-week announcements concerning the Federal Reserve monetary policy announcements and the weekly announcements about the money supply occur outside the trading hours on MTS platform, it is not possible to conduct an intra-day analysis on them.

Sometimes the announcements are not released exactly at the beginning of an interval, following Fleming and Remolana (1997), when announcements are released in the final minute of an interval, we begin the analysis at the start of the next interval. For example, on 05/02/2004 the Unemployment Change for Germany was released at 9:29 A.M., this implies an analysis based on the 9:30–9:35 interval; instead on 05/10/2004 the same news was released at 9:27 A.M., which implies an analysis based on 9:25 A.M.[15].

Following Andersen et al. (2003) we focus on the importance of news during the announcement periods, estimating:

$$R_t = \beta_i S_{it} + \varepsilon_t \tag{4}$$

where R_t is the 5-minute return, S_{it} is the standardized news corresponding to the

[15]For our sample, this time adjustment has been necessary for thirteen news releases, eleven for the Germany Unemployment Change, one for the European Composite Index and one for the U.S. Preliminary Michigan Sentiment.

announcement i at time t. We consider only those observations (R_t, S_{it}) where there is an announcement at time t.

Table 2 reports the results. When we consider each news in isolation, twenty-five news result significant. For the Italian news only the Consumer Price Index; for the German news: IFO Business Climate, Industrial Production and ZEW Economic Sentiment Survey; for the French news: GDP, Business Confidence, Consumer Price Index and Consumer Spending; for the Euro area: Consumer Price Index and Current Account; for the U.S. news: GDP preliminary, Capacity Utilization, Chicago Purchasing Manager, Consumer Confidence, Consumer Price Index, Factory Orders, Industrial Production, ISM Index, ISM Service, Michigan Sentiment Final, Nonfarm Payrolls, New Home Sales, Trade Balance and Initial Jobless Claims.

The U.S. announcements seem to impact the bond returns more than similar European and national news. A possible reason for a stronger impact of U.S. announcements with respect to other news is related to investors' perception of the United States as one of the main driver for global growth. This result is in line with other papers which document a strong influence of U.S. data on Euro area interest rates and bond prices (Andersen et al., 2007; Goldberg and Leonard, 2003; Andersson et al., 2009). In particular, although our reference market and time period is not the same of these papers, we find an equivalent strong significance for the Industrial Production, Jobless Claims, Factory Orders, Chicago Purchasing Manager, ISM Index, ISM Service and Michigan Sentiment Final. On the contrary, Nonfarm Payroll seems to impact only marginally the Italian market and there is no influence of the Retail Sales and Durable Goods.

Among the national announcements, as in Andersson et al. (2009), we find that IFO Business Climate, ZEW Economic Sentiment Survey and German Industrial Production have a significant impact on prices. They also find significant the Consumer Price Index, however, we do not include it in our sample since this is released at 8:00 A.M., before the opening time of our market. For what concern the French news, we also find a significant

impact of Business Confidence and Consumer Price Index, moreover, in spite of their results, we also find relevant the GDP Advance and Preliminary.

Among the Euro area news we find that Consumer Price Index and Current Account significantly impact prices. Andersson et al. (2009)find that only the Consumer Confidence impact the German market. A possible explanation for the smaller importance of Euro news with respect to the national releases could be that many Euro area announcements are released after the national statistics, thus they provide small new information to the investors. The price impact of a non-anticipated information in a release depends not only on the time lag between the reference period of the announcement and the report date, but also on the availability of earlier reports which provide similar information.

Andersen et al. (2003) observe that announcements timing matters since, within a general category of macroeconomic indicators, news on those released earlier tends to have greater impact than those released later. Along the same line, Hess et al. (2008)show that later reports, within a same class of announcements, have a smaller impact on prices of T-bond futures. Andersson et al. (2008) demonstrate that the reason for the small reaction of German bond prices to the aggregate German CPI announcement lies in the earlier release of CPI data for German states.

We group the national and Euro area news into five categories: GDP, prices, net exports, real activity and unemployment, and forward-looking and we look at the importance of each news within the same category. The chronological order of the news in each category is reported in Figure A.4 in the Appendix. Following Andersen et al. (2003), if it is true that Euro area news are less informative that national news because released after, we should find a declining pattern in the R^2. Looking at the R^2 in Table 2 it is generally true that European news have a smaller R^2 when previous national news are released within the same category. One exception is the EU Current Account in the Net Exports category, which has the highest R^2, in fact, this a news that significantly impacts the Italian market.

Finally, only one Italian news impacts the bond prices; this is a surprising result es-

pecially if compared to the large number of U.S. announcements that instead impact the market. However, also Andersen et al. (2003) document that only few macroeconomic indicators have a significant effect on the German bond market. They find a possible explanation in the fact that for the German news only the release day, but not the time, is known in advance. This may result in less market liquidity, hence news effect, around the announcement times. Alternatively the pre-announcement leakage in German announcements may led to price adjustments the days before the actual release.

Andersson et al. (2009) document a systematic leakage in the German employment report that does not have any impact on bond price, since it is known to investors ahead of the scheduled release time. The release time for the Italian indicators are exactly known. Nevertheless, in many cases, the actual release time is indeed different from the scheduled one, as well documented in the footnotes to Table A.2. in the Appendix. Other possible explanations for this result could be related either to the market participants' perception of the reliability of these announcements or to potential leakage in the announcements release. Although there is no evidence for the Italian market of a systematic leakage in macroeconomic releases, as the one documented for the German market.

Table 2: News Response Coefficients

Announcements	# Obs.	R^2	β_k
Italian Announcements			
Quarterly Announcements			
GDP	4	0.310	-3.179
			(-1.51)
Monthly Announcements			
Business Confidence	32	0.092	-1.363
			(-1.62)
Consumer Confidence	31	0.001	0.064
			(0.14)
Consumer Price Index	20	0.155	-1.313**
			(-2.17)
Industrial Orders	12	0.001	0.053
			(0.10)
Industrial Production	19	0.017	-0.320

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Table 2 (cont)

Announcements	# Obs.	R^2	β_k
			(-0.73)
Producer Price Index	19	0.044	-0.615
			(-0.73)
Retail Sales	11	0.006	0.165
			(0.41)
Trade Balance	19	0.006	-0.246
			(-0.67)
German Announcements			
Monthly Announcements			
Factory Orders	30	0.000	-0.059
			(-0.10)
IFO Business Climate	32	0.314	-3.240***
			(-3.35)
Industrial Production	31	0.119	-0.798*
			(-1.89)
Unemployment Change	17	0.002	-0.133
			(-0.11)
ZEW Economic Sentiment Survey	31	0.429	-5.299***
			(-3.38)
French Announcements			
Quarterly Announcements			
GDP Advance	5	0.782	-5.038*
			(-3.18)
GDP Preliminary	3	0.744	-1.146*
			(-3.00)
Monthly Announcements			
Business Confidence	20	0.174	-1.115**
			(-2.52)
Consumer Confidence	21	0.001	0.062
			(0.13)
Consumer Price Index	19	0.183	-1.985**
			(-2.29)
Consumer Spending	22	0.232	-1.165**
			(-2.83)
Industrial Production	20	0.059	-0.890
			(-1.24)
Production Outlook	20	0.034	-0.379
			(-0.91)
Unemployment	8	0.025	0.456
			(0.42)
Euro Area Announcements			
Quarterly Announcements			
GDP Advance	8	0.270	1.278
			(1.26)
Monthly Announcements			
Business Climate Indicator	28	0.128	-1.418
			(-1.39)
Consumer Confidence	29	0.018	0.597
			(0.73)
Consumer Price Index	32	0.106	-1.226*
			(-1.99)
Current Account	15	0.079	-0.811*
			(-2.00)

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Table 2 (cont)

Announcements	# Obs.	R^2	β_k
Flash HICP	31	0.071	-1.130
			(-1.26)
HICP	32	0.072	-0.979
			(-1.64)
Industrial New Orders	31	0.032	-1.182
			(-0.99)
Industrial Production	32	0.014	0.587
			(0.56)
M3	33	0.024	-0.474
			(-0.91)
Producer Price Index	31	0.002	-0.082
			(-0.27)
Retail Sales	31	0.001	0.131
			(0.29)
Trade Balance	28	0.019	-0.385
			(-0.81)
US Announcements			
Quarterly Announcements			
Current Account	11	0.036	0.879
			(0.63)
Employment Cost Index	12	0.052	-1.160
			(-0.75)
GDP advance	12	0.083	-1.233
			(-0.71)
GDP preliminary	10	0.272	-1.842*
			(-1.97)
Monthly Announcements			
Business Inventories	21	0.003	0.158
			(0.20)
Capacity Utilization	32	0.214	-2.782**
			(-2.56)
Chicago Purchasing Managers	33	0.155	-2.675**
			(-2.37)
Composite Index	32	0.001	-0.129
			(-0.17)
Construction Spending	30	0.002	-0.284
			(-0.32)
Consumer Confidence	31	0.153	-3.021*
			(-1.97)
Consumer Price Index	33	0.073	2.190*
			(2.03)
Durable Goods Orders	33	0.036	-1.355
			(-0.91)
Existing Home Sales	32	0.007	-0.410
			(-0.46)
Factory Orders	33	0.155	-1.798**
			(-2.49)
Housing Starts	32	0.004	0.380
			(0.46)
Industrial Production	32	0.188	-2.569**
			(-2.32)
ISM Index	30	0.199	-2.741**
			(-3.59)
ISM Services	33	0.150	-1.846**
			(-2.24)
Michigan Sentiment, preliminary	32	0.022	-0.674
			(-0.73)
Michigan Sentiment, final	31	0.270	-2.018***
			(-3.26)

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Table 2 (cont)

Announcements	# Obs.	R^2	β_k
Nonfarm Payrolls	31	0.105	-2.571**
			(-2.05)
New Home Sales	32	0.193	-2.747**
			(-2.17)
NY Empire State Index	32	0.010	-0.685
			(-1.01)
Personal Income	30	0.000	0.094
			(0.15)
Producer Price Index	33	0.034	-1.330
			(-1.33)
Personal Spending	30	0.039	-1.139
			(-1.07)
Retail Sales	33	0.032	-1.167
			(-0.77)
Trade Balance	33	0.044	-1.038*
			(-1.97)
Wholesales Inventories	33	0.000	0.023
			(0.04)
Initial Jobless Claims	141	0.041	1.156**
			(2.50)

This table reports the regression results for each announcement of Equation 4.
t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$ *** $p < 0.01$

Beber and Brandt (2010) study the effect on bond returns of good and bad macroeconomic news in expansions and recessions using a regression model. They define as good (bad) news all negative (positive) surprises, as defined in equation (1). It is in fact generally the case that negative (positive) surprises generate positive (negative) bond returns. Positive surprises in pro-cyclical indicator generally have a negative effect on bond prices, while positive surprises in counter-cyclical indicators have a positive impact (Balduzzi et al., 2001).

Following Beber and Brandt (2010) we investigate whether the estimated coefficients have the right sign in response to good and bad news, estimating the following regression model:

$$R_t = \beta_i G_{it} S_{it} + \beta_i B_{it} S_{it} + \varepsilon_t \tag{5}$$

where G_{it}=1 if the information released in announcement i at time t is a good news for the bond market and $B_{it} = 1$ if the information released in announcement i at time t is

instead a bad news.

Table A.6 in the Appendix reports the results. Returns show a mixed response to macroeconomic announcements. Among the significant coefficients, return responses to ISM Service and Michigan Sentiment indicators do not show the predicted sign. For what concern the CPI, Goldberg and Leonard (2003) find the same result.

Finally, many times a news is released together with other news, thus, in order to assess the contribution of each news to the change in bond prices we have to consider the news together.

Table 3 illustrates all the times each announcement is released simultaneously to other announcements for the news in the sample.

As in Balduzzi et al. (2001) we decide to include other news in the regression if it is contemporaneously released to the announcement under analysis at least ten percent of the times.

To take into account the possible influence of other news, we regress price changes on the surprise of the announcement under consideration and the surprises in news announced at the same time:

$$R_t = \alpha + \beta_i S_{it} + \sum_{j=1}^{J} \beta_j S_{ijt} + \varepsilon_{it} \tag{6}$$

where R_t represents the return five-minute after the release of the news; β_i is the sensitivity of the return to the announcement; S_{it} is the standardized surprise for announcement i; j is the j^{th} announcement concurrent with announcement i and J is the total number of concurrent announcements; S_{ijt} is the standardized surprise for the j^{th} announcement concurrent with announcement i at time t; β_j is the sensitivity of the return to the j^{th} announcement concurrent with announcement i.

Table A.5 in the Appendix illustrates the results for the significant news using Equation 6. Except few cases, almost all the news are still significant. EU Current Account

loses its significance when it is considered together with IFO Business Climate which is the dominant announcement, as documented by its higher R^2 and the higher value, in absolute term, of its coefficient. Finally, US Capacity Utilization and US Industrial Production are both significant when considered in isolation but they become both insignificant when considered together. These two announcements, which can be both included in the category of real activity, are always released at the same time and are highly correlated (0.84). This is a well documented (Balduzzi et al., 2001; Andersen et al., 2003) case of how the correlation between news events creates a multicollinearity problem.

Table 3: Contemporaneous Announcements Release

8:45 A.M. Announcements	1	2	3	4	5	6	7
1. FR GDP preliminary	8	0	0	0	0	0	0
2. Business Confidence	0	21	0	0	0	20	0
3. Consumer Price Index	0	0	23	0	0	0	0
4. Consumer Spending	0	0	0	23	0	0	0
5. Industrial Production	0	0	0	0	20	0	0
6. Production Outlook	0	20	0	0	0	21	0
7. Unemployment	0	0	0	0	0	0	17

9:30 A.M. Announcements	1	2
1. IT Business Confidence	33	0
2. IT Consumer Confidence	0	31

10:00 A.M. Announcements	1	2	3	4	5	6	7	8
1. IT Industrial Orders	12	0	0	0	0	0	0	0
2. IT Industrial Production	0	19	0	0	0	0	0	0
3. IT Producer Price Index	0	0	19	0	0	0	0	5
4. IT Retail Sales	0	0	0	11	0	3	1	1
5. IT Trade Balance	0	0	0	0	19	1	0	0
6. IFO Business Climate	0	0	0	3	1	33	5	5
7. EA Current Account	0	0	0	1	0	5	15	0
8. M3	0	0	5	1	0	5	0	33

11:00 A.M. Announcements	1	2	3	4	5	6	7	8	9	10	11	12	13
1. IT GDP	4	0	0	0	0	0	0	0	0	0	0	0	0
2. IT Consumer Price Index	0	20	0	13	14	2	15	2	0	0	0	2	0
3. ZEW	0	0	32	0	0	3	0	3	1	5	0	0	0
4. EA Business Climate Indicator	0	13	0	28	28	2	22	2	0	0	2	1	0
5. EA Consumer Confidence	0	14	0	28	29	2	23	2	0	0	2	1	0
6. EA Consumer Price Index	0	2	3	2	2	33	0	33	0	8	0	0	2
7. Flash HICP	0	15	0	22	23	0	31	0	0	0	0	2	0
8. HICP	0	2	3	2	2	33	0	33	0	8	0	0	2
9. EA Industrial New Orders	0	0	1	0	0	0	0	0	31	1	0	0	5
10. EA Industrial Production	0	0	5	0	0	8	0	8	1	33	0	0	0
11. EA Producer Price Index	0	0	0	2	2	0	0	0	0	0	31	2	0
12. EA Retail Sales	0	2	0	1	1	0	2	0	0	0	2	31	0
13. EA Trade Balance	0	0	0	0	0	2	0	2	5	0	0	0	29

12:00 A.M. Announcements	1	2
1. DE Factory Orders	30	0
2. DE Industrial Production	0	31

2:30 P.M. Announcements	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. US Current Account	11	0	0	0	0	0	2	0	0	0	0	0	2	0	1
2. US Employment Cost Index	0	12	7	0	0	0	0	0	0	1	0	1	0	0	3
3. US GDP advance	0	7	12	0	0	0	0	0	0	0	0	0	0	0	2
4. US GDP preliminary	0	0	0	10	0	0	0	0	0	0	0	0	0	0	2
5. US Consumer Price Index	0	0	0	0	34	0	9	0	5	0	0	0	2	1	7
6. US Durable Goods Orders	0	0	0	0	0	33	0	0	0	1	0	1	0	0	12
7. Housing Starts	2	0	0	0	9	0	32	0	0	0	6	0	0	0	7
8. Nonfarm Payrolls	0	0	0	0	0	0	0	33	0	0	0	0	0	0	0
9. NY Empire State Index	0	0	0	0	5	0	0	0	33	0	5	0	4	0	5
10. US Personal Income	0	1	0	0	0	1	0	0	0	30	0	30	0	0	8
11. US Producer Price Index	0	0	0	0	0	0	6	0	5	0	34	0	7	3	6
12. Personal Spending	0	1	0	0	0	1	0	0	0	30	0	30	0	0	8
13. US Retail Sales	2	0	0	0	2	0	0	0	4	0	7	0	34	1	11
14. US Trade Balance	0	0	0	0	1	0	0	0	0	0	3	0	1	33	9
15. Initial Jobless Claims	1	3	2	2	7	12	7	0	5	8	6	8	11	9	143

3:15 P.M. Announcements	1	2
1. US Capacity Utilization	33	33
2. US Industrial Production	33	33

3:45 P.M. Announcements	1	2
1. Michigan Sentiment, preliminary	32	0
2. Michigan Sentiment, final	0	32

4:00 P.M. Announcements	1	2	3	4	5	6	7	8	9	10	11
1. Business Inventories	22	0	0	0	0	0	0	0	0	0	0
2. Chicago Purchasing Managers	0	33	0	0	5	2	4	0	0	2	0
3. US Composite Index	0	0	32	0	0	0	0	0	0	0	0
4. US Construction Spending	0	0	0	30	0	0	0	30	1	0	0
5. US Consumer Confidence	0	5	0	0	32	8	1	0	0	4	0
6. US Existing Home Sales	0	2	0	0	8	32	0	0	0	0	0
7. US Factory Orders	0	4	0	0	1	0	33	0	10	0	0
8. ISM Business Confidence	0	0	0	30	0	0	0	30	1	0	0
9. ISM Non-Manifacturing Business Confidence	0	0	0	1	0	0	10	1	33	0	0
10. New Home Sales	0	2	0	0	4	0	0	0	0	32	0
11. Wholesales Inventories	0	0	0	0	0	0	0	0	0	0	33

This table shows the release time of each announcement and the number of times each announcements is released in contemporaneous with other announcements .

4 Timing and Speed of Adjustment

Following Balduzzi et al. (2001) we investigate how quickly bond prices react to economic news announcements. We run the following regression:

$$R_{\tau t} = \alpha + \beta_i S_{it} + \sum_{j=1}^{J} \beta_j S_{ijt} + \varepsilon_{it} \tag{7}$$

where $R_{\tau t}$ represents the return for different time horizons, from ten-minute before the release of the news to thirty minutes after; β_i is the sensitivity of the return to the announcement; S_{it} is the standardized surprise for announcement i; j is the j^{th} announcement concurrent with announcement i and J is the total number of concurrent announcements; S_{ijt} is the standardized surprise for the j^{th} announcement concurrent with announcement i at time t; β_j is the sensitivity of the return to the j^{th} announcement concurrent with announcement i.

Table 4 illustrates the results for the announcements which resulted significant using Equation 4 . Most of the announcements are incorporated into prices within twenty minutes after the release. IT Consumer Price Index, IFO Business Climate, EU Consumer Price Index, US Initial Jobless Claims, US Capacity Utilization, US Industrial Production, US ISM Index and US New Home Sales remain significant until thirty minutes after the announcement release. US Consumer Price Index and US Nonfarm Payrolls, Michigan Sentiment Final, Chicago Purchasing Manager are still marginally significant after thirty minutes. These results seem to indicate that the Italian market takes a long time to incorporate news into prices.

For the U.S. Treasury market, Balduzzi et al. (2001) find that only few news significantly affect prices after fifteen minutes. In particular, they find that US Capacity Utilization and US ISM Index remain significant after fifteen minutes. These two announcements are still significant until thirty minutes also in our case. Among the announcements that are still significant until thirty minutes, the Italian and the European Consumer Price Index

announcements show an erratic pattern, thus the relevance of their delayed price effects is questioned. Moreover, the table reports individual coefficients, estimated accordingly to Equation (4), this means that the joint significance of groups of coefficients would be much lower.

Finally, these results are in line with Goldberg and Leonard (2003) who find that U.S. economic news affect German yields within one hour of release. Moreover, as pointed out by Andersen et al. (2003) the discrepancy for many announcements between the actual released time and the scheduled one, could explain a smaller news effects around the announcements and more gradual adjustment, perhaps for a few hours after the announcements.

Table 4: Speed of Adjustment

Announcements	-10	0	10	20	30
IT Consumer Price Index	-0.306	0.784	-1.545*	-1.071	-4.430***
FR GDP advance	-1.144	-0.647	-5.084*	-5.956*	-5.428
FR GDP preliminary	0.500	0.078	-1.364	-1.498*	-1.120
FR Business Confidence	-0.075	0.107	-1.072**	-2.303**	-2.111
FR Consumer Price Index	0.054	0.620	-2.006**	-2.615**	-1.734
FR Consumer Spending	0.054	-0.547	-1.031**	-0.297	-0.606
IFO Business Climate	-4.178***	-0.238	-3.026***	-4.199***	-4.900***
DE Industrial Production	-1.476***	-0.050	-0.783*	-0.689	-0.476
ZEW Economic Sentiment Survey	-0.722	1.384***	-5.530***	-4.685***	0.468
EU Consumer Price Index	-0.415	0.266	-1.195*	-0.972	-2.053**
EU Current Account	1.635	-0.601	-0.429	-0.518	0.328
US GDP Preliminary	-3.360***	0.368	-1.767*	0.143	-0.482
US Consumer Price Index	-1.860	-0.123	2.169*	2.335*	2.513*
US Nonfarm Payrolls	-17.802***	0.178	-2.322*	-2.568*	-3.288*
US Trade Balance	-1.850***	-0.438	-1.034	-1.264	0.496
US Initial Jobless Claims	1.057***	-0.336	1.147**	1.446**	1.873**
US Capacity Utilization	0.737	-0.165	-2.878**	-2.973**	-3.774**
US Industrial Production	0.448	0.088	-2.712**	-2.295*	-2.682**
US Michigan Sentiment Final	-0.422	-0.475	-2.004***	-2.306**	-2.666*
US Chicago Purchasing Manager	-3.529***	0.357	-3.563***	-2.817*	-3.891*
US Consumer Confidence	-3.331***	-0.758*	-2.999*	-3.157	-3.023
US Factory Orders	-0.530	-0.026	-1.828**	-1.685	-1.103
US ISM Index	-2.563**	0.438	-2.751***	-4.327***	-4.810***
ISM Service	-1.275*	0.186	-2.024**	-1.532	-1.790
US New Home Sales	-0.977	-0.154	-2.862**	-3.121*	-3.951**

This table reports the regression results for each announcement of Equation 7 .
* $p < 0.10$,** $p < 0.05$, *** $p < 0.01$

5 Conclusion

This paper studies the effects of the arrival of public macroeconomic announcements on bond returns for the Italian government bond market. We consider the public information contained in regularly scheduled macroeconomic announcements and ECB's monetary policy statements. We find that twenty-five of the sixty-eight announcements considered have a significant impact, these are: the Italian news only the Consumer Price Index; for the German news: IFO Business Climate, Industrial Production and ZEW Economic Sentiment Survey; for French news: GDP, Business Confidence, Consumer Price Index and Consumer Spending; for the Euro area: Consumer Price Index and Current Account; for the U.S.: GDP preliminary, Capacity Utilization, Chicago Purchasing Manager, Consumer Confidence, Consumer Price Index, Factory Orders, Industrial Production, ISM Index, ISM Service, Michigan Sentiment Final, Nonfarm Payrolls, New Home Sales, Trade Balance and Initial Jobless Claims.

The U.S. announcements seem to impact the bond returns more than similar European and national news. A possible reason for a stronger impact of U.S. announcements with respect to other news is related to investors' perception of the United States as one of the main driver for global growth. This result is in line with other papers which document a strong influence of U.S. data on Euro area interest rates and bond prices (Andersen et al., 2007; Goldberg and Leonard, 2003; Andersson et al., 2009).

Only one Italian news, Consumer Price Index, has an impact on the bond returns. Other papers (Andersson et al., 2009) find a scarce influence of national news on national markets. A possible explanation for this result is that, although the release time for the Italian indicators are exactly known, often the actual release time is different from the scheduled one, this may lead to less liquidity, hence news effect, around the announcement times. Other possible explanations are related either to the market participants' perception of the reliability of these announcements or to potential leakage in the an-

nouncements release.

Finally, we investigate how quickly bond prices react to economic news announcements, finding that the Italian bond market takes a long time to incorporate news into prices. However, also in this case the the discrepancy between the actual released time and the scheduled one, could explain a smaller news effects around the announcements and a more gradual adjustment later on. Moreover, also these results are in line with the existing literature (Goldberg and Leonard, 2003; Andersen et al., 2003).

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Appendix

Table A.1: Returns Descriptive Statistics

Time Intervals	N	Mean	Variance	Min	Max	Skeweness	Kurtosis	Q_5	Q_{95}
5-min intervals									
	74756	0.015	4.583	-31.723	31.715	-0.178	11.681	-3.141	3.132
8-min intervals									
	46619	0.026	7.804	-48.160	74.420	0.236	31.003	-4.069	4.046
10-min intervals									
	37586	0.031	9.961	-97.308	72.415	-0.522	47.089	-4.605	4.582
15-min intervals									
	24406	0.045	14.700	-66.776	71.915	0.039	23.246	-5.766	5.689
20-min intervals									
	17447	0.058	20.552	-66.776	75.895	0.128	20.026	-6.878	6.668
30-min intervals									
	12561	0.090	28.635	-83.240	74.817	0.128	18.756	-8.042	7.747

Some returns are missing observations. No interpolation method has been used since this creates the problem that the returns suffer from forward looking bias, affecting the results. Thus, returns between time t and t-1 are calculated using no information about time t+1. This means that if no new quote is available in a five-minute interval the return is missing. This involves, on average, only 0.2% of the sample data.
This table reports the descriptive statistics about returns at different trading intervals. For each time interval there is the number of observations (*N*), the mean (*Mean*), the variance (*Variance*), the Skewness (*Skewness*), the Kurtosis (*Kurtosis*) and the values for the 5^{th} (Q_5) and the 95^{th} (Q_{95}) percentiles.

Table A.2: Wald Test for Unbiasedness of Survey Data

News	# Obs.	R^2	α	β	Wald Test	p-value
Italian Announcements						
Quarterly Announcements						
GDP	3	0.971	-0.011	3.333	18.25	0.163
			(-5.57)	(5.77)		
Monthly Announcements						
Business Confidence[1]	32	0.823	3.572	0.966	1.09	0.349
			(0.48)	(11.81)		
Consumer Confidence	31	0.687	15.805	0.851	1.33	0.281
			(1.42)	(7.99)		
Consumer Price Index[2]	20	0.473	-0.000	1.193	2.40	0.119
			(-1.37)	(4.02)		
Industrial Orders[3]	12	0.304	0.013	2.041	1.52	0.266

Table A.2. (cont)

News	# Obs.	R^2	α	β	Wald Test	p-value
			(1.52)	(2.09)		
Industrial Production[4]	19	0.031	-0.000	0.385	1.45	0.262
			(-0.14)	(0.74)		
Producer Price Index[5]	19	0.746	-0.002	1.746	5.34	0.016*
			(-1.70)	(7.07)		
Retail Sales[6]	11	0.231	0.000	0.657	0.37	0.699
			(0.14)	(1.64)		
Trade Balance[7]	19	0.8960	225.106	1.092	1.00	0.387
			(1.42)	(12.10)		
German Announcements						
Monthly Announcements						
Factory Orders[8]	30	0.258	0.005	1.109	0.80	0.461
			(1.20)	(3.12)		
IFO Business Climate	33	0.936	-4.951	1.055	3.32	0.050*
			(-1.02)	(21.35)		
Industrial Production	31	0.360	-0.002	1.345	0.67	0.521
			(-0.90)	(4.04)		
Unemployment Change[9]	17	0.539	4.423	1.539	1.08	0.365
			(0.37)	(4.19)		
ZEW Economic Sentiment Survey	31	0.851	-3.587	1.020	1.42	0.260
			(-1.02)	(12.87)		
French Announcements						
Quarterly Announcements						
GDP Advance[10]	5	0.602	-0.006	2.167	0.67	0.573
			(-1.08)	(2.13)		
GDP Preliminary[11]	8	0.876	-0.000	0.998	0.34	0.723
			(-0.33)	(6.50)		
Monthly Announcements						
Business Confidence[12]	21	0.811	10.480	0.902	1.19	0.326
			(1.01)	(9.03)		
Consumer Confidence[13]	14	0.638	-5.646	0.800	1.25	0.322
			(-1.27)	(4.60)		
Consumer Price Index[14]	23	0.767	-0.000	1.162	1.40	0.269
			(-1.66)	(8.32)		
Consumer Spending[15]	23	0.322	0.004	1.540	1.72	0.203
			(1.57)	(3.16)		
Industrial Production[16]	20	0.460	-0.008	2.017	4.90	0.020**
			(-3.08)	(3.19)		
Production Outlook[17]	21	0.659	1.564	0.930	0.64	0.536
			(0.93)	(6.06)		
Unemployment[18]	14	0.823	0.017	0.883	1.84	0.201
			(1.52)	(7.48)		
Euro Area Announcements						
Quarterly Announcements						
GDP Advance[19]	9	0.780	-0.002	1.303	0.79	0.490
			(-1.26)	(5.23)		
GDP Preliminary	10	0	1	.	.	.
			(.)	(.)		
Monthly Announcements						

Table A.2. (cont)

News	# Obs.	R^2	α	β	Wald Test	p-value
Business Climate Indicator[20]	28	0.883	0.000	1.052	1.46	0.250
			(0.59)	(13.99)		
Consumer Confidence	29	0.885	-0.633	0.942	0.48	0.623
			(-0.78)	(14.39)		
Consumer Price Index	32	0.953	-0.000	1.063	1.12	0.340
			(-1.05)	(24.74)		
Current Account[21]	15	0.365	-1.490	0.689	2.04	0.169
			(-1.43)	(2.73)		
ECB Meetings	33	.	.	.	.	.
			(.)	(.)		
Flash HICP[22]	31	0.905	-0.003	1.122	2.07	0.144
			(-1.72)	(16.65)		
HICP[23]	32	0.939	0.000	0.986	0.21	0.816
			(0.24)	(21.46)		
Industrial New Orders[24]	31	0.369	-0.000	1.266	0.38	0.690
			(-0.12)	(4.12)		
Industrial Production[25]	32	0.524	-0.000	0.791	1.51	0.238
			(-0.29)	(5.95)		
M3	33	0.900	0.004	0.954	2.23	0.125
			(1.11)	(16.68)		
Producer Price Index[26]	31	0.930	-0.000	1.110	2.73	0.082*
			(-0.51)	(19.49)		
Retail Sales[27]	31	0.414	-0.000	1	0.00	1
			(-0.00)	(4.53)		
Trade Balance[28]	28	0.855	184.303	0.940	0.33	0.721
			(0.58)	(12.40)		
U.S. Announcements						
Quarterly Announcements						
Current Account	11	0.939	-3.266	0.982	0.02	0.976
			(-0.21)	(11.76)		
Employment Cost Index	12	0.239	0.006	0.303	8.32	0.007***
			(3.93)	(1.77)		
GDP advance	12	0.786	-0.006	1.012	6.65	0.015**
			(-0.92)	(6.06)		
GDP preliminary	10	0.956	0.003	0.910	0.87	0.454
			(1.32)	(13.12)		
Monthly Announcements						
Business Inventories[29]	21	0.417	0.000	1.052	0.32	0.728
			(0.11)	(3.59)		
Capacity Utilization	32	0.972	-0.003	1.003	0.54	0.588
			(-0.11)	(32.53)		
Chicago Purchasing Managers	33	0.050	39.527	0.359	4.60	0.018**
			(2.37)	(1.28)		
Composite Index[30]	32	0.882	-0.000	1.254	5.51	0.009***
			(-1.78)	(15.01)		
Construction Spending	30	0.050	0.001	0.480	1.64	0.212
			(0.34)	(1.22)		
Consumer Confidence	32	0.640	7.420	0.930	0.40	0.677
			(0.59)	(7.31)		
Consumer Price Index	33	0.885	-0.001	1.363	8.64	0.001***
			(-2.65)	(15.44)		
Durable Goods Orders	33	0.559	-0.010	2.424	6.85	0.003***
			(-2.06)	(6.27)		
Existing Home Sales[31]	32	0.741	0.941	0.869	3.20	0.055*
			(1.50)	(9.27)		

Table A.2. (cont)

News	# Obs.	R^2	α	β	Wald Test	p-value
Factory Orders	33	0.850	0.001	0.882	1.69	0.201
			(0.92)	(13.25)		
Housing Starts	32	0.259	531.604	0.731	0.73	0.490
			(1.20)	(3.24)		
Industrial Production	32	0.702	-0.003	1.630	6.44	0.005***
			(-3.54)	(8.40)		
ISM Index	30	0.778	-1.350	1.022	0.06	0.941
			(-0.18)	(9.91)		
ISM Service	33	0.330	10.940	.826	0.91	0.413
			(0.86)	(3.90)		
Michigan Sentiment,preliminary[32]	32	0.683	11.574	0.857	3.29	0.051*
			(1.19)	(8.03)		
Michigan Sentiment,final[33]	32	0.921	4.298	0.954	0.47	0.623
			(0.93)	(18.71)		
Nonfarm Payrolls	33	0.176	60.501	0.532	3.49	0.043**
			(1.59)	(2.57)		
New Home Sales	32	0.251	439.310	0.649	2.35	0.113
			(1.80)	(3.17)		
NY Empire State Index	32	0.229	8.686	0.610	1.93	0.162
			(1.95)	(2.98)		
Personal Income	30	0.865	0.000	0.984	0.26	0.770
			(0.72)	(13.38)		
Producer Price Index	33	0.719	-0.002	1.674	6.45	0.005*
			(-2.15)	(8.91)		
Personal Spending	30	0.862	-0.000	1.107	0.91	0.414
			(-1.30)	(13.24)		
Retail Sales	33	0.740	-0.000	1.166	0.94	0.401
			(-0.31)	(9.39)		
Trade Balance	33	0.855	-7.139	0.887	2.28	0.120
			(-1.88)	(13.54)		
Wholesale Inventories	33	0.006	0.005	0.225	2.52	0.097
			(1.85)	(0.43)		
Weekly Announcements						
Initial Jobless Claims	142	0.540	44.716	0.862	2.13	0.123
			(2.03)	(12.82)		

t statistics in parentheses

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

[1] The Announcement on 27/10/2004 was released at 10:15 A.M..

[2] Only 20 announcements were released at 11:00 A.M..

[3] 02/09/2005 and 01/09/2006 are missing survey observations.

[4] There are fourteen missing survey observations.

[5] 31/03/2006 is a missing survey observation.

[6] 12/02/2004 is a missing survey observation

[7] 26/02/2004 is a missing survey observation.

[8] 30/01/2004 and 30/09/2005 are missing survey observations.

[9] We have eighteen missing survey observations.

[10] 05/03/2004 is a missing survey observation.

[11] 20/04/2004, 19/08/2004 and 15/09/2004 are missing survey observations.

[12] 25/02/2006 is a missing survey observation.

[13] 14 announcements were released at 8:40 A.M..

[14] 23 announcements were released at 8:45 A.M..

[15] 23 announcements were released at 8:45 A.M..

[16] 20 announcements were released at 8:45 A.M..

[17] 21 announcements were released at 8:45 A.M..

[18] 14 announcements were released at 8:45 A.M..

[19] 9 announcements were released at 11:00 A.M..

[20] 29 announcements were released at 11:00 A.M., however, one of these has a missing actual information.

[21] 15 announcements were released at 10:00 A.M..

[22] 31 announcements were released at 11:00 A.M..

[23] 32 announcements were released at 11:00 A.M..

Table A.2. (cont)

News	# Obs.	R^2	α	β	Wald Test	p-value

[24] 31 announcements were released at 11:00 A.M..
[25] 32 announcements were released at 11:00 A.M..
[26] 31 announcements were released at 11:00 A.M..
[27] 31 announcements were released at 11:00 A.M..
[28] 28 announcements were released at 11:00 A.M..
[29] 21 announcements were released at 4:00 P.M..
[30] 32 announcements were released at 4:00 P.M..
[31] 32 announcements were released at 4:00 P.M..
[32] 32 announcements were released at 3:45 P.M..
[33] 32 announcements were released at 3:45 P.M..

Table A.3: Announcements

News	Observations[2]	Time[3]	Unit[4]	Source[5]	Dates[6]	Day of the Week[1] Mon.	Tue.	Wed.	Thu.	Fri.
Italian Announcements[7]										
Quarterly Announcements										
GDP	10	Varies[8]	%change	ISTAT	13/02/2004–11/08/2006	1	2	0	4	3
Monthly Announcements										
Business Confidence	33	09:30 A.M.[9]	level	ISAE	28/01/2004–25/10/2006	0	7	11	12	3
Consumer Confidence	31	09:30 A.M.[10]	level	ISAE	24/02/2004–24/10/2006	0	11	9	9	2
Consumer Price Index	33	11:00 A.M.[11]	%change	ISTAT	04/02/2004–31/10/2006	1	5	7	3	16
Industrial Orders	30	10:00 A.M.[12]	%change	ISTAT	19/02/2004–19/10/2006	6	2	4	10	8
Industrial Production	33	10:00 A.M.[13]	%change	ISTAT	13/02/2004–10/11/2006	10	10	5	3	5
Producer Price Index	33	10:00 A.M.[14]	%change	ISTAT	30/01/2004–31/10/2006	8	6	4	7	8
Retail Sales	32	10:00 A.M.[15]	%change	ISTAT	24/02/2004–20/10/2006	2	2	9	9	10
Trade Balance	33	10:00 A.M.[16]	level	ISAE	20/02/2004–18/10/2006	0	0	9	5	19
German Announcements[17]										
Monthly Announcements										
Factory Orders	32	12:00 A.M.[18]	level	Destatis	05/02/2004–06/11/2006	4	3	6	10	9
IFO Business Climate	33	10:00 A.M.[19]	level	Destatis	27/01/2004–25/10/2006	5	11	7	6	4
Industrial Production	32	12:00 A.M.[20]	%change	Destatis	06/02/2004–07/11/2006	4	9	1	7	11
Unemployment Change	32	Varies[21]	K	Destatis	05/02/2004–02/11/2006	0	9	7	16	0
ZEW Economic Sentiment Survey	31	11:00 A.M.[22]	level	Destatis	16/03/2004–17/10/2006	0	31	0	0	0
French Announcements										
Quarterly Announcements										
GDP advance	10	8:40/8:45/8:50 A.M.[23]	%change	INSEE	12/02/2004–10/11/2006	0	0	1	3	6
GDP preliminary	11	8:40/8:45/8:50 A.M.	%change	INSEE	20/02/2004–22/08/2006	0	2	1	0	8
Monthly Announcements										
Business Confidence	29	8:40/8:45/8:50 A.M.[24]	level	INSEE	29/01/2004–25/10/2006	5	6	7	8	3
Consumer Confidence	30	8:40/8:45/8:50 A.M.[25]	level	INSEE	05/02/2004–31/10/2006	2	6	3	8	11
Consumer Price Index	29	8:40/8:45/8:50 A.M.[26]	%change	INSEE	12/03/2004–10/11/2006	1	8	6	4	11
Consumer Spending	28	8:45/8:50 A.M.[27]	%change	INSEE	24/02/2004–24/10/2006	1	12	4	5	6
Industrial Production	32	8:40/8:45/8:50 A.M.[28]	%change	INSEE	12/02/2004–10/11/2006	7	6	4	6	9
Production Outlook	30	8:40/8:45/8:50 A.M.[29]	level	INSEE	29/01/2004–25/10/2006	5	7	7	8	3
Unemployment	15	8:45 A.M.[30]	%change	INSEE	30/01/2004–30/10/2006	0	2	1	3	9

Continued on next page...

Table A.3. (cont)

Euro Area Announcements[31]										
Quarterly Announcements										
GDP advance	10	11:00 A.M.[32]	level	EUROSTAT	13/02/2004–14/08/2006	1	2	0	3	4
GDP preliminary	10	11:00 A.M.	level	EUROSTAT	04/03/2004–01/09/2006	0	2	4	2	2
Monthly Announcements										
Business Climate Indicator	31	11:00 A.M.[33]	level	EUROSTAT	30/01/2004–31/10/2006	3	4	4	6	14
Consumer Confidence	31	11:00 A.M.[34]	level	EUROSTAT	30/01/2004–31/10/2006	3	4	4	6	14
Consumer Price Index	33	11:00 A.M.[35]	%change	EUROSTAT	27/02/2004–17/10/2006	5	4	7	11	6
Current Account	33	10:00 A.M.[36]	mln Euro	EUROSTAT	30/01/2004–24/10/2006	6	11	6	5	5
ECB Meetings[37]	33	1:45 P.M.[38]	%change	ECB	05/02/2004–02/11/2006	0	0	1	32	0
Flash HICP	33	11:00 A.M.[39]	%change	EUROSTAT	04/02/2004–31/10/2006	1	5	8	4	15
HICP	33	11:00 A.M.[40]	%change	EUROSTAT	27/02/2004–17/10/2006	5	4	7	11	6
Industrial New Orders	33	11:00 A.M.[41]	%change	EUROSTAT	26/01/2004–24/10/2006	5	7	11	5	5
Industrial Production	33	11:00 A.M.[42]	%change	EUROSTAT	17/02/2004–17/10/2006	6	8	5	6	8
M3	33	10:00 A.M.[43]	%change	EUROSTAT	29/01/2004–27/10/2006	4	5	4	9	11
Producer Price Index	32	11:00 A.M.[44]	%change	EUROSTAT	03/02/2004–06/11/2006	5	8	6	7	6
Retail Sales	33	11:00 A.M.[45]	%change	EUROSTAT	05/02/2004–07/11/2006	5	5	10	4	9
Trade Balance	32	11:00 A.M.[46]	mln Euro	EUROSTAT	19/02/2004–18/10/2006	6	7	9	6	4
U.S. Announcements[47]										
Quarterly Announcements										
Current Account	11	2:30 P.M.	bln $	BEA	12/03/2004–18/09/2006	1	2	1	1	6
Employment Cost Index	12	2:30 P.M.	%change	BLS	29/01/2004–31/10/2006	0	2	0	3	7
GDP advance	12	2:30 P.M.	%change	BEA	30/01/2004–27/10/2006	0	0	0	2	10
GDP preliminary	10	2:30 P.M.[48]	%change	BEA	27/02/2004–30/08/2006	0	2	3	2	3
Monthly Announcements										
Business Inventories	33	Varies[49]	%change	CENSUS	12/02/2004–13/10/2006	1	8	3	9	12
Capacity Utilization	32	3:15 P.M.[50]	%change	Federal Reserve Board	17/02/2004–17/10/2006	2	8	9	4	9
Chicago Purchasing Manager	33	4:00 P.M.[51]	level	NAPM	30/01/2004–31/10/2006	4	5	5	6	13
Composite Index	33	4:00 P.M.[52]	%change	The Conference Board	19/02/2004–19/10/2006	6	1	0	26	0
Construction Spending	30	4:00 P.M.[53]	%change	CENSUS	02/02/2004–01/11/2006	10	6	5	5	4
Consumer Confidence	32	4:00 P.M.[54]	level	The Conference Board	27/01/2004–31/10/2006	0	32	0	0	0
Consumer Price Index	33	2:30 P.M.	%change	BLS	20/02/2004–18/10/2006	0	4	18	5	6
Durable Goods Orders	33	2:30 P.M.[55]	%change	CENSUS	28/01/2004–26/10/2006	0	1	14	11	7
Existing Home Sales	33	4:00 P.M.[56]	M	NAR	26/01/2004–25/10/2006	8	11	6	5	3
Factory Orders	33	4:00 P.M.[57]	%change	CENSUS	04/02/2004–02/11/2006	2	8	8	10	5
Housing Starts	32	2:30 P.M.[58]	K	CENSUS	18/02/2004–18/10/2006	0	15	10	6	1
Industrial Production	32	3:15 P.M.[59]	%change	Federal Reserve Board	17/02/2004–17/10/2006	2	8	9	4	9
ISM Index	30	4:00 P.M.[60]	level	ISM	01/03/2004–01/11/2006	10	6	5	5	4
ISM Non-Manufacturing Business Confidence	33	4:00 P.M.[61]	level	ISM	04/02/2004–03/11/2006	3	3	14	7	6
Michigan Sentiment, preliminary	34	3:45 P.M.[62]	level	University of Michigan	13/02/2004–09/11/2006	0	1	0	3	30
Michigan Sentiment, final	33	3:45 P.M.[63]	level	University of Michigan	30/01/2004–27/10/2006	0	0	2	1	30
Nonfarm Payrolls	33	2:30 P.M.[64]	level	BLS	06/02/2004–1/11/2006	0	0	0	0	33

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Table A.3. (cont)

New Home Sales	32	4:00 P.M. [65]	K	CENSUS	26/02/2004–26/10/2006	6	4	10	8	4
NY Empire State Index	32	2:30 P.M. [66]	level	Federal Reserve Bank of New York	17/02/2004–16/10/2006	10	8	6	5	4
Personal Income	30	2:30 P.M.[67]	%change	BEA	02/02/2004–30/10/2006	9	2	2	8	9
Producer Price Index	33	2:30 P.M.	%change	BLS	18/03/2004–17/10/2006	0	17	1	6	9
Personal Spending	30	2:30 P.M.[68]	%change	BEA	02/02/2004–30/10/2006	9	2	2	8	9
Retail Sales	33	2:30 P.M.	%change	CENSUS	12/02/2004–13/10/2006	2	10	3	11	7
Trade Balance	33	2:30 P.M.[69]	bln $	CENSUS	02/02/2004–01/11/2006	1	5	10	8	9
Wholesale Inventories	33	4:00 P.M.[70]	%change	CENSUS	09/02/2004–09/11/2006	5	5	5	10	8
	Weekly Announcements									
Initial Jobless Claims	142	2:30 P.M.[71]	K	BLS	29/01/2004–09/11/2006	0	0	4	138	0

[1] Distribution of announcements by day of the week.
[2] Total number of observation in the sample.
[3] Central European Time (CET)
[4] Unit in which is reported the announcement. Level are reported as units, dollars or euros.
[5] ISTAT (Italian National Institute of Statistics), ISAE (The Institute of Studies in Economic Analysis), INSEE (National Institute of Statistics and Economic Studies), Destatis (Federal Statistical Office), EUROSTAT, ECB, BEA (Bureau of Economic Analysis), BLS (Bureau of Labor statistics), NAPM (National Association of Purchasing Management), CENSUS (Bureau of the Census), ISM (Institute of Supply Management), NAR (National Association of Realtors), The Conference Board, Federal Reserve Board.
[6] Starting and ending dates of the announcements samples.
[7] Italian Announcements times are variable, although, they are usually released between 9:30 A.M. and 2:30 P.M. CET Time.
[8] The usual release time is 10:00 A.M., however, for our sample period, the GDP was also released at 10:30 A.M. (13/02/2004, 13/05/2004, 09/08/2004, 12/11/2004). The announcements on 15/02/2005, 12/05/2005 and 11/05/2006 are dropped out because they are no-trading days.
[9] The announcement is released at 10:15 A.M. on 27/10/2004.The announcement on 25/05/2005 is dropped out because it is a non-trading day.
[10] The announcements on 24/05/2005 and 21/12/2005 are dropped out because they are non-trading days.
[11] Announcements between 04/02/2004 and 29/10/2004 were released at 9:30 A.M.. The announcement on 30/11/2004 was released at 10:00 A.M.. The announcement on 28/10/2005 was released at 1:00 P.M.. The announcement on 04/01/2005 had a missing survey observation.The announcement on 31/05/2005 was dropped out because it is a non-trading day.
[12] During our sample period, Industrial Orders announcements were released nine times at 09:30 A.M. (from 19/02/2004 to 20/05/2004 and from 19/07/2004 to 19/11/2004), once at 10:30 A.M. on 18/06/2004, seven times at 11:00 A.M. (20/01/2005, 18/02/2005, 20/06/2005, 20/07/2005, 20/10/2005, 20/12/2005, 19/01/2006) and once at 01:00 P.M. on 17/12/2004. The announcements on 25/03/2005 and 20/06/2006 were dropped out because they are non-trading days.
[13] Industrial Production announcements were released also at 9:30 A.M. (from 13/02/2004 to 13/12/2004), at 11:00 A.M. on 12/11/2005 and at 12.30 P.M. on 13/07/2005 and 10/11/2006. The announcement on 13/10/2005 is dropped out.
[14] Producer Price Index announcements were released also at 9:30 A.M. (30/01/2004, 29/04/2004, 31/05/2004, 29/11/2004, 29/12/2004), at 10:30 A.M. (on 27/02/2004 and 30/03/2004 and from 28/06/2004 to 29/10/2004) and at 11:00 A.M. (31/01/2005, 31/01/2006). The announcement on 30/05/2005 is dropped out.
[15] Retail Sales announcements were released also at 9:30 A.M. (from 24/02/2004 to 23/04/2004 and from 23/06/2004 to 28/11/2004), at 11:00 A.M. (23/03/2005, 22/04/2005, 25/05/2005, 23/09/2005, 22/12/2005, from 23/02/2006 to 25/07/2006, 20/10/2006) and at 11:30 A.M. on 23/12/2004. The announcement on 25/05/2005 is dropped out.
[16] Announcements on 02/09/2005 and 01/09/2006 had missing survey observations.
[17] The timing of the German Announcements is not regular, however, they usually occur between 8:00 A.M. and 02:00 P.M. CET Time. We cannot include in our analysis many other German news took into consideration in other works (such as GDP, Current Account, Import Price Index, Retail Sales, Producer Price Index, Trade Balance, Wholesale Price Index), since they are all released before our market opens.
[18] 1:30 P.M. 05/02/2004. The announcement on 06/06/2005 and 31/03/2006 are dropped out. The announcement on 31/03/2006 had a missing actual observation.
[19] The announcement on 25/05/2005 is dropped out.
[20] The announcement on 07/05/2004 was released at 1:00 P.M.. The announcement on 07/06/2005 is dropped out because it is a non-trading day.
[21] The announcement on 31/05/2005 is dropped out because it is a non-trading day. The announcement on 08/06/2004 was released before the market opening time. Eleven announcements did not happen at the beginning of the trading interval, so we changed the time accordingly.
[22] The announcement on 24/05/2005 is dropped out because it is a non-trading day.
[23] The announcement on 12/02/2004 is dropped out because it is a non-trading day. The announcements for the 1Q 2005 and 1Q 2006 are missing observations.
[24] The announcement on 27/05/2005 is dropped out.
[25] The announcement on 31/05/2005 is dropped out.
[26] The announcements on 10/12/2004 and on 13/10/2005 are dropped out.
[27] The announcement on 24/05/2005 and 21/12/2005 are dropped out.
[28] The announcements on 09/04/2004 and 10/10/2005 are dropped out.
[29] The announcement on 26/02/2004 has a missing survey observation. The announcement on 27/05/2005 is dropped out.The announcements on 30/03/2004 and

29/03/2004 were released at 3:00 P.M. and the announcement on 27/03/2006 was released at 2:45 P.M..
[30] The announcement on 31/12/2004 and 31/05/2005 are dropped out because non-trading days. The announcement on 27/06/2006 is released at 3:00 P.M. We dropped out seventeen announcements because released outside the trading times range.
[31] From 1st March 2004 all Eurostat News Releases and Economic Indicator are issued at 11:00 A.M. instead of 12:00 A.M.
[32] The announcement on 01/06/2005 is dropped out.
[33] The announcement on 27/02/2004 is released at 12:00 A.M.. The announcement on 31/05/2005 is dropped out. The announcements on 30/01/2004 and 30/09/2004 have missing actual information.
[34] The announcements on 30/01/2004 and 24/02/2004 were released at 12:00 A.M.. The announcement on 31/05/2005 is dropped out.
[35] The announcement on 27/02/2004 was released at 12:00 A.M.
[36] The announcements on 27/05/2005 is dropped out. There are eighteen missing survey observations.
[37] Press conferences about monetary policy decisions.
[38] The announcement on 02/06/2005 is dropped out. The announcement on 01/04/2004 was released at 12:45 A.M..
[39] The announcements on 04/02/2004 and 27/02/2004 were released at 12:00 A.M.. The announcement on 31/05/2005 is dropped out.
[40] 12:00 A.M. on 27/02/2004.
[41] 12:00 A.M. on 26/01/2004 and 24/02/2004. The announcement on 24/05/2005 is dropped out.
[42] 12:00 A.M. on 17/02/2004
[43] The announcement on 31/05/2005 is dropped out.
[44] The announcement on 03/02/2004 is released at 12:00 A.M.. The announcements on 03/08/2004 and 02/06/2005 are dropped out.
[45] The announcement on 05/02/2004 is released at 12:00 A.M.. The announcement on 05/03/2004 has a missing survey observation. The announcement on 03/06/2005 is dropped out.
[46] The announcement on 19/02/2004 is released at 12:00 A.M.. The announcement on 24/05/2005 is dropped out. The announcements on 20/04/2004, 19/08/2004 and 15/09/2004 have missing survey observations.
[47] For the U.S. announcements we convert the Eastern Standard Time (EST) into the Central European Time (CET). In U.S. the daylight saving time starts on the first Sunday of April and ends on the last Sunday of October. In Europe, the daylight saving time starts on the last Sunday of March and ends on the last Sunday of October. For our sample period, the daylight saving time periods for the U.S. were: 04/04/2004–31/10/2004, 03/04/2005–30/10/2005, 02/04/2006–29/10/2006; for Europe: 28/03/2004–31/10/2004, 27/03/2005–30/10/2005, 26/03/2006–29/10/2006.
[48] The announcement on 26/05/2005 is dropped out.
[49] Either at 2:30 P.M.(12 announcements) or at 4:00 P.M. (22 announcements).
[50] The announcement on 14/04/2006 is dropped out.
[52] The announcement on 31/05/2005 is dropped out.
[52] 3:50 P.M. on 19/02/2004.
[53] The announcements on 02/02/2004, 02/08/2004, 01/06/2005 and 01/05/2006 are dropped out.
[54] The announcements on 31/05/2005 and 28/12/2005 are dropped out.
[55] The announcement on 25/05/2005 is dropped out.
[56] The announcement on 24/05/2005 is dropped out.
[57] The announcement on 02/06/2005 is dropped out.
[58] The announcement on 20/06/2006 is dropped out.
[59] The announcement on 14/04/2006 is dropped out.
[60] The announcement on 02/02/2004, 02/08/2004, 01/06/2005 and 01/05/2006 are dropped out.
[61] The announcement on 03/06/2005 is dropped out.
[62] 4:00 P.M. on 13/10/2006 and 09/11/2006.
[63] 4:00 P.M. on 27/10/2006.The announcement on 27/05/2005 is dropped out.
[64] The announcement on 03/06/2005 is dropped out.
[65] The announcement on 25/05/2005 is dropped out.
[66] The announcement on 17/04/2006 is dropped out.
[67] The announcement on 02/02/2004, 03/08/2004, 27/05/2005 and 01/05/2006 are dropped out.
[68] The announcement on 02/02/2004, 03/08/2004, 27/05/2005 and 01/05/2006 are dropped out.
[69] The announcement on 13/10/2005 is dropped out.
[70] The announcement on 08/06/2005 is dropped out.
[71] The releases on 26/05/2005, 02/06/2005, 09/06/2005 and 13/10/2005 are dropped out.

Table A.4: Wald Test for Efficiency of Survey Data

News	# Obs.	R^2	Wald Test	p-value	# Lags
Italian Announcements					
Quarterly Announcements					
GDP	3	0.995	197.37	0.045**	0
Monthly Announcements					
Business Confidence	20	0.511	0.61	0.775	12
Consumer Confidence	31	0.381	0.31	0.957	12
Consumer Price Index	20	0.901	1.01	0.655	9
Industrial Orders	12	0.915	2.15	0.475	5
Industrial Production	19	0.812	1.08	0.565	9
Producer Price Index	19	0.750	1.71	0.315	7
Retail Sales	11	0.816	2.22	0.334	4
Trade Balance	19	0.787	0.42	0.840	9
German Announcements					
Monthly Announcements					
Factory Orders	30	0.475	0.38	0.923	12
IFO Business Climate	33	0.457	0.56	0.823	12
Industrial Production	31	0.386	0.31	0.958	12
Unemployment Change	17	0.521	0.31	0.898	7
ZEW Economic Sentiment Survey	32	0.914	5.33	0.025**	12
French Announcements					
Quarterly Announcements					
GDP Advance	5	0.140	0.33	0.626	1
GDP Preliminary	8	0.874	2.30	0.443	
Monthly Announcements					
Business Confidence	21	0.790	1.88	0.284	8
Consumer Confidence	14	0.959	3.88	0.370	6
Consumer Price Index	23	0.716	0.50	0.812	10
Consumer Spending	23	0.666	0.40	0.869	
Industrial Production	20	0.970	3.54	0.392	
Production Outlook	21	0.997	31.93	0.137	10
Unemployment	17	0.614	0.26	0.900	6
Euro Area Announcements					
Quarterly Announcements					
GDP Advance	28	0.700	1.55	0.415	3
Monthly Announcements					
Business Climate Indicator	28	0.720	0.64	0.748	12
Consumer Confidence	29	0.712	0.82	0.645	12
Consumer Price Index	33	0.672	1.20	0.442	12
Current Account	15	0.632	0.19	0.952	9
Flash HICP	31	0.496	0.49	0.860	12
HICP	33	0.553	0.72	0.704	12
Industrial New Orders	31	0.822	2.31	0.157	12
Industrial Production	33	0.593	0.85	0.618	12

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Table A.4. (cont)

News	# Obs.	R^2	Wald Test	p-value	# Lags
M3	33	0.497	0.66	0.751	12
Producer Price Index	31	0.701	1.17	0.446	12
Retail Sales	31	0.670	1.19	0.427	12
Trade Balance	29	0.855	1.97	0.269	12
U.S. Announcements					
Quarterly Announcements					
Current Account	11	0.658	0.96	0.567	6
Employment Cost Index	12	0.554	0.93	0.545	6
GDP advance	12	0.491	0.72	0.630	4
GDP preliminary	10	0.863	1.58	0.529	4
Monthly Announcements					
Business Inventories	22	0.765	1.63	0.335	8
Capacity Utilization	33	0.519	0.63	0.771	12
Chicago Purchasing Managers	33	0.640	1.19	0.415	12
Composite Index	32	0.603	0.89	0.594	12
Construction Spending	30	0.958	9.45	0.011**	12
Consumer Confidence	32	0.507	0.60	0.792	12
Consumer Price Index	34	0.757	2.08	0.152	12
Durable Goods Orders	33	0.774	2.29	0.123	12
Existing Home Sales	32	0.375	0.35	0.947	12
Factory Orders	33	0.857	3.98	0.029**	12
Housing Starts	32	0.756	1.81	0.220	12
Industrial Production	33	0.307	0.26	0.908	12
ISM Business Confidence	30	0.664	0.82	0.640	12
ISM Non-Manufacturing Business Confidence	33	0.521	0.72	0.703	12
Michigan Sentiment,preliminary	32	0.459	0.50	0.864	12
Michigan Sentiment,final	32	0.682	1.25	0.396	12
Nonfarm Payrolls	33	0.736	1.86	0.193	12
New Home Sales	32	0.481	0.54	0.833	12
NY Empire State Index	33	0.453	0.48	0.871	12
Personal Income	30	0.823	1.93	0.241	12
Producer Price Index	34	0.685	1.45	0.304	12
Personal Spending	30	0.740	1.18	0.456	12
Retail Sales	34	0.897	6.51	0.004***	12
Trade Balance	33	0.650	1.24	0.390	12
Wholesale Inventories	33	0.594	0.98	0.532	12
Weekly Announcements					
Initial Jobless Claims	143	0.077	0.83	0.621	

** $p < 0.05$, *** $p < 0.01$

Table A.5: News Response Coefficients

Announcements	# Obs.	R^2	β_k
Italian Announcements			
Monthly Announcements			
Consumer Price Index	20	0.129	-1.545*
			(-1.94)
German Announcements			
Monthly Announcements			
IFO Business Climate	33	0.293	-3.177***
			(-3.405)
Industrial Production	31	0.115	-0.783*
			(-1.84)
ZEW Economic Sentiment Survey	32	0.472	-5.180***
			(-3.27)
French Announcements			
Quarterly Announcements			
GDP Advance	5	0.795	-5.084*
			(-3.24)
GDP Preliminary	3	0.806	-1.364
			(-2.88)
Monthly Announcements			
Business Confidence	21	0.170	-1.095**
			(-2.16)
Consumer Price Index	23	0.185	-2.006**
			(-2.23)
Consumer Spending	23	0.181	-1.031**
			(-2.50)
Euro Area Announcements			
Monthly Announcements			
Consumer Price Index	33	0.110	-1.217**
			(-2.05)
Current Account	15	0.237	-0.638
			(-1.01)
US Announcements			
Quarterly Announcements			
GDP preliminary	10	0.401	-0.248
			(-0.15)
Monthly Announcements			
Capacity Utilization	33	0.230	-1.985
			(-1.52)
Chicago Purchasing Managers	33	0.282	-3.542***
			(-3.06)
Consumer Confidence	32	0.301	-1.720
			(-1.18)
Consumer Price Index	34	0.117	2.351*
			(2.15)
Factory Orders	33	0.194	-1.624**
			(-2.22)

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Table A.5. (cont)

Announcements	# Obs.	R^2	β_k
Industrial Production	33	0.230	-1.060
			(-0.72)
ISM Index	30	0.231	-2.833***
			(-4.49)
ISM Services	33	0.176	-2.036**
			(-2.57)
Michigan Sentiment, final	32	0.176	-2.004***
			(-3.12)
Nonfarm Payrolls	33	0.087	-2.322*
			(-2.03)
New Home Sales	32	0.245	-2.221**
			(-2.05)
Trade Balance	33	0.093	-1.907***
			(-2.92)
Initial Jobless Claims	143	0.013	1.147**
			(2.52)

This table reports the regression results for each announcement of Equation 6.
t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$ *** $p < 0.01$

Table A.6: Effect of Good and Bad News on Bond Returns

Announcements	Expected Sign[1]	α	β_G	β_G
IT Consumer Price Index	–	-4.375	-3.903	1.952
FR Business Confidence	–	0.447	0.277	-1.543*
FR Consumer Price Index	–	-1.130	-2.509	-1.130
FR Consumer Spending	–	0.498	0.754	-1.995***
IFO Business Climate	–	-0.575	-2.975	-3.075
DE Industrial Production	–	-0.120	-0.971	-0.425
ZEW Economic Sentiment Survey	–	-2.634	-7.468**	-3.697**
EU Consumer Price Index	–	-7.076	-6.191**	2.241*
EU Current Account	–	0.792	-0.311	-0.997
US Consumer Price Index	–	4.663	4.728	-1.034
US Nonfarm Payrolls	–	0.352	-3.473	-1.242
US Trade Balance	+	-1.276	-2.361**	1.056
US Initial Jobless Claims	–	0.020	1.790***	0.457
US Capacity Utilization	–	1.390	-1.080	-5.586**
US Industrial Production	–	-1.169	-3.176	-2.257
US Michigan Sentiment Final	–	-1.362	-3.377***	-0.602
US Chicago Purchasing Manager	–	3.300	-2.818	-3.973**
US Consumer Confidence	–	0.588	-1.838	-4.104
US Factory Orders	–	1.372	-0.453	-3.331***
US ISM Index	–	-1.157	-0.813	-1.935
ISM Service	–	-0.536	-3.902***	-0.398
US New Home Sales	-	0.278	-3.329	-2.659

[1] + (−) indicates a positive (negative) return reaction to a higher than expected announcement of individual figures.
* $p < 0.10$, ** $p < 0.05$ *** $p < 0.01$

Figure A.4: Different Categories of European and National News
This figure shows the Euro-are and national announcements in chronological order grouped in different categories.

GDP	Prices	NET Exports	Real Activity and Unemployment	Forward- looking
1. FR GDP	1. M3	1. IT Trade Balance	1. DE Unemployment Change	1. ZEW
2. IT GDP	2. IT CPI	2. EU Trade Balance	2. FR Unemployment	2. IT Consumer Confidence
3. FR GDP	3. Flash HICP	3. EU Current account	3. DE Factory Orders	3. IFO
4. EU GDP	4. FR CPI		4. EU Retail Sales	4. IT Business Confidence
	5. EU CPI		5. DE Industrial Production	5. FR Business Confidence
	6. HICP		6. FR Industrial Production	6. FR Production Outlook
	7. IT PPI		7. IT Industrial Production	7. EU Business Climate Indicator
	8. EU PPI		8. EU Industrial Production	8. EU Consumer Confidence
			9. IT Retail Sales	9. FR Consumer Confidence
			10. IT Industrial Orders	10. FR Consumer Spending
			11. EU Industrial New Orders	